

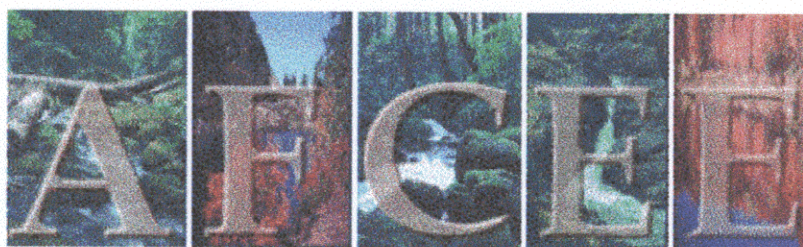
## VOLUME 3 - HEALTH AND SAFETY PLAN

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# Quality Project Plan for Groundwater Circulation Well Technology Evaluation and Optimization - Phase I

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*Prepared For:*



## **Air Force Center for Environmental Excellence**

Environmental Restoration Directorate  
Brooks Air Force Base, Texas

Contract Number: F41624-99-C-8034

*Prepared By:*

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**October 1999**

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**VOLUME 3 - HEALTH AND SAFETY PLAN**

**Quality Project Plan  
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Optimization Phase I  
Cape Canaveral Air Station, Florida**

**Prepared for**

**Air Force Center for Environmental Excellence (AFCEE)  
Environmental Restoration Directorate  
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Contract No. F41624-99-C-8034**

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**October 1999**

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### **Health and Safety Plan for Groundwater Circulation Well Technology Evaluation and Optimization at Building 1831, CCAS**

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**Mr. Paul Foote  
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**Date**

## NOTICE

This Health and Safety Plan (HSP) has been prepared for the United States Air Force Center for Environmental Excellence by Parsons Engineering Science, Inc. for the purpose of aiding in the implementation of a technology evaluation for groundwater remediation. The technology will be demonstrated on an Air Force Installation Restoration Program (IRP) site where other corrective measures are currently being evaluated. To be consistent with the site procedures and activities, this HSP has been prepared based on the most current version (Revision 4) of the program-wide HSP; however, because of this study's limited scope and data needs, and because the field work is limited to a single site (Building 1831) on CCAS, some of the program-wide HSP requirements have been modified. These changes do not reduce safety to lower levels than the program-wide HSP; rather, they are intended to focus safety requirements for the work and site specific potential hazards. This HSP is a project specific document and not a formal revision of the IRP QAPP.

Acceptance of this report in performance of the contract under which it is prepared does not mean that the United States Air Force adopts the conclusions, recommendations or other views expressed herein, which are those of the contractor only and do not necessarily reflect the official position of the United States Air Force.

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## **PREFACE**

This Health and Safety Plan (Volume II of Quality Project Plan) addresses issues of health and safety for personnel involved in the field activities being conducted at the 45th Space Wing Facilities (CCAS, Building 1381) for Groundwater Circulation Well Technology Evaluation and Optimization. The plan describes personnel protective measures, emergency contacts, and site-specific health and safety concerns for the field efforts.

This document was prepared by Parsons ES under contract with the Air Force Center for Environmental Excellence (AFCEE) at Brooks Air Force Base, San Antonio, Texas (Contract No. F41624-99-C-8034). Mr. James Gonzales, representing AFCEE, is the Team Chief. The Parsons ES Facility Coordinator is Mr. Todd Swingle, P.E., the Parsons ES Project Manager is Mr. John Mackey, P.E., and the Technical Director is Dr. Robert Hinchee, P.E.

Mr. Ed Carver, 45th CES/CEVR, provides project coordination at CCAS.

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## **EXECUTIVE SUMMARY**

This Health and Safety Plan (HASP) is Volume 3 of a Quality Project Plan that was developed for Parsons ES personnel performing Groundwater Circulation Well Evaluation and Optimization activities at Building 1381, Cape Canaveral Air Station (CCAS). The HASP is part of the Quality Project Plan (QPP). The QPP consists of the following documents:

- **Volume 1 Work Plan**
- **Volume 2 Sampling and Analysis Plan (Field Sampling Plan and QAPP)**
- **Volume 3 Health and Safety Plan (Contractor Specific)**

This HASP describes employee training and medical monitoring requirements, safety and health risks, personal protective requirements, site work zones, emergency contacts, contingency plans, and decontamination.

## **SECTION 1 INTRODUCTION**

The purpose of this Health and Safety Plan (HASP) is to establish personnel protective standards, safety practices, and safety procedures for use during Groundwater Circulation Well (GCW) Evaluation and Optimization field activities at Cape Canaveral Air Station (CCAS). All Parsons Engineering Science (Parsons ES) personnel engaged in project activities must be familiar with this plan and comply with its requirements. All subcontractors shall prepare and provide to Parsons ES a HASP for their activities per the stipulations of the applicable subcontract that shall, in general, meet the requirements of this HASP at a minimum. A copy of this HASP will be provided to the subcontractors for their information. Copies of the subcontractor HASPs will be kept at the field office.

### **1.1 HEALTH AND SAFETY PLAN OVERVIEW**

- This HASP was developed for performing GCW Evaluation and Optimization field activities at Building 1381, CCAS.

This HASP describes employee training and medical monitoring requirements, safety and health risks, personal protective requirements, site work zones, emergency contacts, contingency plans, and decontamination.

Chemicals of potential concern are described in Section 3 of this HASP.

In addition, the following information is included in the HASP Appendices:

- Appendix A - Includes information on air monitoring equipment operation, calibration and maintenance,
- Appendix B - Includes health and safety forms,
- Appendix C - Site-specific safety training courses offered by the Air Force at CCAS and other site-specific safety information,

- Appendix D - Presents identifying characteristics of venomous Florida snakes,
- Appendix E - Describes directions to medical emergency facilities and the locations of all sites addressed by this project,
- Appendix F - Includes copies of Material Safety Data Sheets (MSDS) for compounds used during field activities,
- Appendix G - Summarizes the blast zones and danger areas around active launch complexes at CCAS.

## 1.2 PROJECT TEAM ORGANIZATION

Responsibilities of project personnel as they pertain to Health and Safety (H&S) are described below.

Responsibilities of the project manager (or designee) include the following:

- ensuring that a background review of the sites is conducted,
- coordinating the preparation and execution of the HASP,
- preparing and organizing the field team,
- coordinating with the on-site H&S officer and field team leaders in determining protection level, enforcing site control, and ensuring that personnel are briefed on health and safety issues.

Responsibilities of the project H&S officer include the following:

- coordinating the preparation and execution of the HASP,
- identifying and selecting H&S procedures to protect personnel,
- reviewing and approving the HASP,
- identifying qualified personnel to serve as on-site H&S officers,
- conducting periodic audits to determine if the HASP is being followed,
- establishing corrective measures based on the audit findings.

Responsibilities of the on-site H&S officers include the following:

- coordinating with the project manager to organize and prepare the background review for the sites,
- maintain contact with base client representatives regarding work scope and health and safety issues,
- inform base security personnel of work activities,
- correspond with base support personnel for weather reports and no-dig days,
- selecting appropriate protective clothing and equipment,
- periodically inspecting protective clothing and equipment,
- ensuring that protective clothing and equipment are properly stored and maintained,
- confirming each team member's suitability for work based on a physician's recommendation,
- confirming each team member's HAZWOPER training is current,
- conducting daily H&S briefings,
- ensuring that the work parties are monitored for signs of stress, such as heat stress, and fatigue,
- implementing the HASP,
- conducting periodic inspections to determine if the HASP is being followed,
- ensuring that the "buddy" system is enforced,
- knowing emergency procedures, evacuation routes, and the telephone numbers of the ambulance, local hospital, poison control center, fire department, and police department,
- notifying local public emergency officials, when necessary;
- coordinating emergency medical care,
- insure that all health and safety equipment is in working order and properly calibrated, with written tracking log,
- insure MSDS file up to date and accurate,



- selecting decontamination solutions appropriate for the type of chemical contamination on site,
- controlling the decontamination of all equipment, personnel, and samples from contaminated areas,
- assuring proper disposal of contaminated clothing and materials,
- assuring that all required health and safety equipment is available,
- advising medical personnel of potential exposures and consequences,
- notifying emergency response personnel by telephone or radio in the event of an emergency,
- completing accident report form as necessary.

Project personnel involved in field activities are responsible for:

- taking all responsible precautions to prevent injury to themselves and other employees,
- implementing the HASP and reporting to the on-site H&S officer any deviations from anticipated conditions described in this plan,
- maintaining visual contact between partners (buddy),
- performing only those tasks they believe they can do safely, and immediately reporting any accidents and/or unsafe conditions to the on-site H&S officer.

## **SECTION 2**

### **EMPLOYEE TRAINING AND MEDICAL MONITORING REQUIREMENTS**

This section describes training and medical surveillance requirements for field personnel.

#### **2.1 TRAINING**

All field personnel (including subcontractors) must have received 40 hours of initial training in hazardous waste operations or have extensive work experience in hazardous waste activities in order to participate in this project in accordance with 29 CFR Part 1910.120(e). All field personnel must be current in their annual 8-hour refresher training. Subcontractors will provide documentation of initial and refresher training. Copies of training certificates for all Parsons ES and Subcontractor field personnel shall be kept on record in the field office.

The on-site H&S officer will be responsible for developing a site-specific occupational hazard briefing program and providing training to all personnel that are to work on the site investigation at the base. This training will consist of at least the following topics:

- name of personnel responsible for site safety and health,
- safety, health, and other hazards at the site,
- proper use of personal protective equipment,
- work practices by which the employee can minimize risk from hazards,
- safe use of engineering controls and equipment on the site,
- use of portable air monitoring equipment,
- acute effects of compounds at the site,

- emergency procedures,
- decontamination procedures.

In addition to an introductory briefing, the on-site H&S officer shall address the following in daily briefings:

- tasks to be performed,
- time constraints (e.g., rest breaks, cartridge changes),
- hazards that may be encountered, including their effects, how to recognize symptoms or monitor them, concentration limits, or other danger signals.

In addition, access/safety-training courses for specific sites may be offered by the Air Force. A list of these courses and the site to which they pertain and additional site-specific safety information can be found in Appendix C.

## **2.2 MEDICAL SURVEILLANCE**

The Occupational Safety and Health Act (29 CFR Part 1910.120(f)) requires that all personnel engaged in operations involving hazardous materials be enrolled in a medical surveillance program.

Parsons ES will use the services of a licensed occupational health physician with knowledge and experience in the hazards associated with this project. All field personnel must have a yearly physical. Subcontractors must provide documentation of enrollment in a medical surveillance program. Evidence of medical monitoring participation shall be kept on file in the field office for all field personnel. Field personnel working in Level C or higher shall be medically certified for respirator usage. Certification shall be in the form of a physicians approval documented on the medical monitoring certification.

## **SECTION 3 SAFETY AND HEALTH RISKS**

This section describes physical and chemical safety and health risks.

### **3.1 PHYSICAL HAZARDS**

Potential physical hazards include subsurface hazards; overhead electrical hazards; motor vehicles and heavy equipment; noise-induced hearing loss; active site issues; heat stress; venomous snakes and alligators; and insects.

#### **3.1.1 Subsurface Hazards**

Before any drilling, determination will be made as to whether underground installations, including sewers, telephone, water, fuel, or electrical lines, will be encountered, and, if so, where such underground installations are located. Parsons ES will stake subsurface sampling locations, and the Base point-of-contact shall ensure that Base and utility clearances are secured. All locations where a drilling rig or other heavy drilling equipment will be used shall be hand post holed to a minimum depth of four (4) feet below land surface, and to a diameter equivalent to the outside diameter of the drilling auger prior to initiating drilling activities. Undeveloped sites or sites with limited development may be exempted from this requirement by Owner's written permission.

#### **3.1.2 Overhead Electrical Lines and Thunderstorms**

Precautions will be exercised when drilling near any overhead electrical lines. The minimum lateral clearance between overhead electrical lines of 50 kilovolts (KV) or less and the drill rig is 10 feet. For lines rated over 50 KV, the minimum lateral clearance between the lines and any part of the rig is 10 feet plus 0.4 inch for each KV over 50 KV. A reduction in clearance shall only be performed as outlined in 29CFR1926.416(g).

The potential for adverse weather occurring at CCAS is high. Hurricanes, funnel clouds and lightning are potential concerns associated with working in the field at CCAS.



CCAS will announce over the base intercom the potential for adverse weather. A Phase I lightning warning means that lightning is within 5 nautical miles. At that time the field team should prepare to seek cover and the drillers should lower the tower and halt drilling activities. A Phase II lightning warning means that lightning is imminent or occurring and no one is to be outside (seek shelter inside a building or vehicle). Field teams should return to the field office until Phase II has been lifted. CCAS and PAFB loudspeaker announcements regarding lightning warnings shall be relayed to field team members by the on-site H&S officer or designee as these announcements may not be heard at all locations. Field personnel and subcontractors shall be prepared for stand-by time in work and for break-down of equipment if necessary.

### **3.1.3 Slip, Trip, and Fall Hazards**

All work sites may contain slip, trip and fall hazards for site workers, such as:

- holes, pits, or ditches,
- slippery surfaces,
- steep grades,
- uneven grades, and
- sharp objects, such as nails, metal shards, and broken glass.

Site personnel will be instructed to look for potential safety hazards and immediately inform the On-site Health and Safety Officer or the Field Team Leader about any new hazards. If the hazard cannot be immediately removed, actions must be taken to warn site workers about the hazard.

### **3.1.4 Motor Vehicles and Heavy Equipment Hazards**

Working with large motor vehicles and heavy equipment can be a major hazard at this site. Injuries can result from equipment hitting or running over personnel, or overturning of vehicles. Drill rigs clamps and ropes will be inspected in accordance with 29 CFR Part 1926.251. Vehicles and heavy equipment design and operation will be according to 29 CFR Parts 1926.600 through 1926.602. In particular, the following precautions will be used to help prevent injuries and accidents:

- brakes, hydraulic lines, light signals, fire extinguishers, fluid levels, steering, tires, horn, and other safety devices will be checked and recorded by equipment operator on a log sheet at the beginning of each week or ten day work period,
- large motor vehicles (including drill rigs, backhoes, dump trucks, etc.) will not be backed up unless the vehicle has a reverse signal alarm audible above the surrounding noise level, backup warning lights, or the vehicle is backed up only when an observer signals it is safe to do so,
- motor vehicle cabs will be kept free of all non-essential items and all loose items will be secured,
- parking brakes will be set before shutting off any vehicle.

The operator of a piece of heavy equipment has a limited field of vision and therefore may not be aware that someone is near the equipment being operated. While heavy equipment is required to be equipped with warning devices such as back-up alarms, and the operator is required to operate with caution, it is incumbent upon personnel in the area to maintain sufficient distance from the equipment. For example, a sufficient distance is beyond the reach of a backhoe turning a full 360 degrees with its bucket and boom fully extended. It is also incumbent upon personnel in the area to ensure that they have made eye contact with the operator prior to moving within the reach of the backhoe or other mechanical equipment. The operator must cease operations and rest the bucket or other extension on the ground before personnel approach. Caution should be exercised at all times.

Suspended loads present another area of concern. As suspended loads may drop without warning, personnel shall never walk beneath a suspended load. In addition, loads which are to be chained, tied or rigged shall be inspected prior to being lifted or suspended. Field personnel shall ensure that the subcontractor performs the following safety checks. Chains shall be checked for wear, cuts, kinking and proper attachment prior to hoisting. Ropes and cables shall be checked for fraying, wear, kinks, and knotting prior to hoisting. Equipment exhibiting any of these characteristics shall be replaced prior to hoisting and must be rated for greater than two times the estimated weight of the load. Chains, ropes, or cables will be attached to lifting lugs or will be attached in such a way as the bottom of the load is supported at a minimum of four

points. Strapping materials other than chain, rope or cable shall not be used. Harnessing or rigging methodologies that do not support the bottom of the load will not be used.

### **3.1.5 Excavation and Trenching Activities**

Portions of the work performed will include excavation and/or trenching work. A subcontractor will generally perform this type of work, but field personnel shall be familiar with and following general excavation and trenching safety guidelines. Subcontractor will maintain a "competent person" on sites during trenching/excavating activities. The on-site H&S officer will coordinate with the competent person to ensure work is performed in a safe manner as outlined in the U.S. Department of Labor - OSHA Construction Industry Digest (OSHA 2202 - 1995 (Revised)), and reference applicable portions of 29 CFR Part 1926.

"The estimated location of utility installations - such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work - shall be determined prior to opening an excavation. 1926.651(B)(1)." Utility clearance shall be coordinated and scheduled through the CCAS IRP site contact and the plumbing and communications offices. Sufficient notice shall be given for scheduling of utility clearances, at least one week at a minimum. Depending on the scale of the work to be performed, the utility offices may wish to have a representative present during the work. Under no circumstances shall work commence without utility clearance.

"When excavation operations approach the estimated location of underground installations, the exact location of the installations shall be determined by safe and acceptable means (i.e. hand digging). While the excavation is open, underground installations shall be protected, supported, or removed, as necessary, to safeguard employees. 1926.651(b)(3)&(4)."

"Each employee in an excavation shall be protected from cave-ins by an adequate protective system except when:

- Excavations are made entirely in **stable rock**, or excavations are less than 5 feet (1.524 meters) in depth and **examination of the ground by a competent person** provides no indication of a **potential cave-in**. 1926.652(a)(1)(i)&(ii),
- Protective systems shall have the capacity to resist, without failure, all loads that are intended or could reasonably be expected to be applied or transmitted to the system. 1926.652(a)(2).

"Employees shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Protection shall be provided by placing and keeping materials or equipment at least 2 feet (0.6096 meters) from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary. 1926.651(j)(2)."

"Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by a competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard-increasing occurrence. These inspections are only required when employee exposure can be reasonably anticipated. 1926.651(k)(1)."

"Where a competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety. 1926.651(k)(2)."

"A stairway, ladder, ramp, or other safe means of egress shall be located in trench excavations that are 4 feet (1.2192 meters) or more in depth so as to require no more than 25 feet (7.62) meters of lateral travel for employees. 1926.651(C)(2)."

No field personnel shall enter an excavation that exceeds four feet in depth or meets the definition of a confined space as detailed in 29 CFR 1910.146. Therefore, any environmental samples required of the excavation or trench shall be obtained by using a

backhoe or hand auger to bring the soil to ground surface. Personnel shall maintain a distance of at least two feet from the edge of an excavation. This distance shall be greater as sloughing of soils becomes apparent. Field personnel shall ensure that the subcontractor barricades and tapes the excavation(s) at the end of each work-day to protect against injury to pedestrian traffic.

### 3.1.6 Confined Spaces

Field personnel may at times be exposed to areas that may be considered confined spaces. Per 29 CFR Part 1910.146, a "confined space" means a space that:

1. is large enough and so configured that an employee can bodily enter and perform assigned work,
2. has limited or restricted means for entry and exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited entry), and
3. is not designed for continuous employee occupancy.

Permits may be required for entry into certain confined spaces. Per 29 CFR Part 1910.146 "Permit required confined space" (permit space) means a confined space that has one or more of the following characteristics:

1. contains or has a potential to contain a hazardous atmosphere,
2. contains a material that has the potential for engulfing an entrant,
3. has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section, or
4. contains any other recognized serious safety or health hazard.

Exposure to hazardous atmospheres is of particular concern. Per 29 CFR Part 1910.146, a "hazardous atmosphere" means an atmosphere that may expose employees to

the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit space), injury, or acute illness from one or more of the following:

1. flammable gas, vapor, or mist in excess of 10% of its lower flammable limit (LFL),
2. airborne combustible dust at a concentration that meets or exceeds its LFL,
3. atmospheric oxygen concentration below 19.5% or above 23.5%,
4. atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in Subpart G, Occupational Health and Environmental Control, or in Subpart Z, Toxic and Hazardous Substances, of this part (29 CFR Part 1910.146) and that could result in employee exposure in excess of its dose or permissible exposure limit,
5. any other atmospheric condition that is immediately dangerous to life or health.

If a confined space meets the criteria above, a Confined Space Entry Plan shall be formulated including a Confined Space Entry Permit. A Confined Space Entry Permit and Confined Space Entry Plan will be discussed by the Site Safety and Health Officer before field operations are to commence. The Confined Space Entry Plan shall include a description of the confined space, potential hazardous atmospheres, entrance and exit routes and procedures, ventilation requirements, air monitoring requirements (equipment and action levels), PPE requirements, etc. Communication equipment and procedures will be tested upon arrival at the site. Rescue personnel will be positioned to minimize the time required to reach the entrants.

The permit space will be monitored by a "competent person" to determine initial air concentrations and any subsequent changes. Monitoring will typically be used to identify and quantify airborne levels of oxygen, carbon monoxide, hydrogen sulfide (sewer gas), volatile organics, and combustible gases. Equipment typically consists of the OVAs, multi-gas meters; and petroleum hydrocarbon colorimetric tubes with hand pumps. All

air monitoring equipment shall be calibrated and maintained in accordance with manufacturers' instructions. Calibration and maintenance activities will be documented in the health and safety logbook or on a logsheet. All instruments used during the entry shall be intrinsically safe.

In general the following rules shall be remembered by field personnel in regard to confined spaces:

- Never enter a permitted confined space without first obtaining an entry permit,
- Be able to identify and recognize a confined space. Some will be posted, but others may not be. If a space could in any way have an atmosphere different from normal air, or if it contains anything which could trap or cause injury, take appropriate precautions,
- Testing is the only way to determine if the atmosphere in a confined space is safe to enter. Test equipment must be calibrated, in good working order, and used correctly,
- Know what other precautions are required, and take them. Know what hazards are present, or what hazards might develop. Make certain you know how to keep them from becoming a problem,
- Make sure the atmosphere does not change while you are in the confined space. Monitor continuously or test frequently,
- Never enter a confined space without appropriate rescue equipment and personnel available. This includes standby person or attendant, whose main job is to watch and make sure you stay safe. Never enter a confined space to attempt a rescue on your own.

### 3.1.7 Noise-Induced Hearing Loss

Planned project activities may involve the use of heavy equipment. The unprotected exposure of site workers to noise during activities can result in noise-induced hearing

loss. The on-site H&S officer will ensure that either earmuffs or disposable foam earplugs are made available to all personnel near sources of high intensity noise (>90 dBA or other level as mandated by site regulations).

### **3.1.8 Active Site Issues**

Before any drilling or sampling activities begin at an active site, the base point-of-contact shall ensure that clearance arrangements are made with the site-specific contact and other base personnel. Any site-specific hazards or security issues pertaining to launch complex or other facility operations shall be identified to Parsons ES by the site-specific contact and other base personnel. Authorization to enter these sites and work areas will not be granted until health and safety issues are identified and field personnel are briefed on any site-specific concerns. For example, special precautions may be necessary at sites with active fuel storage areas (explosive hazard).

The base point-of-contact shall ensure that the Parsons ES project manager is informed of any planned launches, including the safety zones surrounding an active launch complex at the time of a launch. The Parsons ES project manager or designee will be responsible for confirming launch schedules with Cape Support. The phone number for launch schedule information is (407) 853-5211. When a launch occurs, personnel must evacuate certain areas of the installation for several hours. Appendix G describes active launch complexes and their safety zones. The on-site H&S officer will ensure that project personnel are informed of launches and the related restricted areas.

### **3.1.9 Heat Stress**

The use of protective equipment may create heat stress. Monitoring of personnel wearing impervious clothing should commence when the adjusted ambient temperature is 77.5°F or above. Table 3.1 presents the suggested frequency for such monitoring. Monitoring frequency should increase as the ambient temperature increases or as slow recovery rates are observed. Heat stress monitoring should be performed by a person



**TABLE 3.1**  
**SUGGESTED FREQUENCY OF PHYSIOLOGICAL MONITORING**  
**FOR FIT AND ACCLIMATIZED WORKERS<sup>1</sup>**

Adjusted Temperature <sup>2</sup>	Normal Work Ensemble <sup>3</sup>	Impermeable Ensemble
90°F (32.2°C) or above	After each 45 minutes of work	After each 15 minutes of work
87.5°-90°F (30.8°- 32.2°C)	After each 60 minutes of work	After each 30 minutes of work
82.5°-87.5°F (28.1°- 30.8°C)	After each 90 minutes of work	After each 60 minutes of work
77.5°-82.5°F (25.3°- 28.1°C)	After each 120 minutes of work	After each 90 minutes of work

Source: NIOSH/OSHA/USCG/EPA, 1985.

1. For work levels of 250 kilocalories/hour.
2. Calculate the adjusted air temperature (ta adj) by using this equation:  

$$ta\ adj\ (F) = (ta - 1) \div (1 - \% \text{ sunshine})$$

Measure air temperature (ta) with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to produce a shadow. (100 percent sunshine = no cloud cover and a sharp, distinct shadow; 0 percent sunshine = no shadows.)

3. A normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants. As described in Section 4, a short sleeve shirt may be worn if no dermal hazard is present.

with current first aid certification, trained to recognize heat stress symptoms. One person on each field team shall be designated by the on-site H&S officer to monitor team members for heat stress. For monitoring the body's recuperative abilities to excess heat, one or more of the following techniques will be used. Other methods for determining heat stress monitoring, such as the wet bulb globe temperature (WBGT) Index from the American Conference of Governmental Industrial Hygienist (ACGIH) TLV Booklet can be used.

To monitor the worker, measure:

- Heart rate. Count the radial pulse during a 30-second period as early as possible in the rest period.
  - If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same,
  - If the heart rate still exceeds 110 beats per minute at the next rest period, shorten the following work cycle by one-third.
- Oral temperature. Use a clinical thermometer (3 minutes under the tongue) or similar device to measure the oral temperature at the end of the work period (before drinking).
  - If oral temperature exceeds 99.6°F (37.6°C), shorten the next work cycle by one-third without changing the rest period,
  - If oral temperature still exceeds 99.6°F (37.6°C) at the beginning of the next rest period, shorten the following cycle by one-third,
  - Do not permit a worker to wear a semi-permeable or impermeable garment when oral temperature exceeds 100.6°F (38.1°C).

Proper training and preventive measures will aid in averting loss of work productivity and serious illness. Heat stress prevention is particularly important because once a person suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat related illness. To avoid heat stress the following steps should be taken:

- Adjust work schedules:
  - Modify work/rest schedules according to monitoring requirements,
  - Mandate work slowdowns as needed,
  - Perform work during cooler hours of the day if possible, or at night if adequate lighting can be provided.
- Provide shelter (air-conditioned, if possible) or shaded areas to protect personnel during rest periods,
- Maintain worker's body fluids at normal levels. This is necessary to ensure that the cardiovascular system functions adequately. Daily fluid intake must approximately equal the amount of water lost in sweat, i.e., eight fluid ounces (0.23 liters) of water must be ingested for approximately every eight ounces (0.23 kg) of weight lost. The normal thirst mechanism is not sensitive enough to ensure that enough water will be drunk to replace lost sweat. When heavy sweating occurs, encourage the worker to drink more. The following strategies may be useful:
  - Maintain water temperature at 50° to 60°F (10° to 16.6°C),
  - Provide small disposal cups that hold about four ounces (0.1 liter),
  - Have workers drink 16 ounces (0.5 liters) of fluid (preferably water or dilute drinks) before beginning work,
  - Urge workers to drink a cup or two every 15 to 20 minutes, or at each monitoring break. A total of 1 to 1.6 gallons (4 to 6 liters) of fluid per day are recommended, but more may be necessary to maintain body weight.

Workers should be trained to recognize the symptoms of heat stress.

#### **3.1.10 Venomous Snakes and Alligator Hazards**

Some work sites may contain venomous snakes or alligators. In most instances, these animals, when left alone, will eventually retreat to a more preferred habitat away from people. Site personnel will be made aware of the potential presence of these animals and directed to immediately inform the on-site H&S officer or the field team

leader if one is encountered. Measures will then be taken to ensure that site personnel are aware of the hazard. Personnel will be instructed to move away from these animals (if chased by an alligator, run zigzag and/or climb a tree), and provide the animal with the opportunity to move to another area. If an animal poses a continued hazard to personnel, the base point-of-contact will be notified and base support may be contacted to remove the animal.

Venomous snakes that may be found in this area include:

- Eastern Diamondback Rattlesnake - 7-8 feet in length; found in almost any habitat, but most commonly in palmetto flatlands, pine woods, abandoned fields or brushy/grassy areas; aggressive,
- Pygmy Rattlesnake - usually less than 18 inches long; found in almost any location with lakes, ponds or marshes; favors palmetto flatlands or areas with slash pines and wire grass; rattle sounds like buzzing insect,
- Cottonmouth Moccasin - exceeds 5 feet in length; variable color patterns; characteristic whitish mouth lining shown when in a defensive posture; found along stream banks, in swamps and margins of lakes; unpredictable disposition,
- Coral Snake - usually less than 24 inches long; found in pine woods, lake and pond borders, old brush piles and rotting logs; generally shy and seldom aggressive.

A photograph identifying each of these snakes is included in Appendix D.

### **3.1.11 Insects and Spiders**

Nearly all work sites may contain ticks, venomous spiders, and venomous insects. Caution should be taken when opening the casing around monitoring wells. Any personnel with a known allergic reaction shall notify the on-site H&S officer as well as their buddy so that appropriate precautions can be taken.

Several diseases (e.g., Lyme disease from deer ticks) may be transmitted from ticks. Therefore, bites from both wood and deer ticks may present potential hazards to human health. Light colored clothing may be worn so that any ticks present are more easily

seen. In addition, site personnel should thoroughly inspect themselves at the end of the day and remove any ticks that are beneath clothing and/or attached to skin. Ticks are small, round-shaped, dark colored insects that are the size of small seeds. They can be removed with tweezers, taking care to remove the head.

Black widow and brown recluse spiders, both venomous, may also be present in and around structures (e.g., buildings, well casings) or vegetation. Bites from these spiders can cause swelling and intense pain in the bite area and in some instances have caused deaths. Site personnel will be made aware of the potential hazards associated with venomous spiders and instructed to avoid contact with them. Photographs identifying these spiders are included in Appendix D.

Chiggers are very small red spiders present throughout the area. Precautionary measures against chiggers include tucking clothing in pants and pant legs into boots. Once under the skin, they are difficult to remove but can be smothered by applying a commercial ointment or nail polish to the bite area.

Venomous insects include wasps, bees, hornets, and red ants.

### 3.1.12 Launch Mishaps

The potential for launch mishaps at active launch complexes at CCAS exists. Mishaps can include rocket explosions/crashes, fuel releases, hazardous chemical discharges, etc. In the event that work is planned in the vicinity of such an occurrence, field personnel should contact base support representatives to discuss additional exposure potential and safety concerns related to the specific mishap. Such incidents may require the use of special PPE, and monitoring equipment, and may require special access and work procedures. Compounds of concern include petroleum hydrocarbons, PAHs, chlorinated solvents, metals, hydrazine compounds and derivatives, and other fuel related products.

Specifically, the Delta rocket explosion above Launch Complex 17 in early 1997 impacted several areas in which field activities are planned. Areas impacted include Launch Complexes 5/6, 17, 18, 26, 31/32, 5/6 Spin Test, Observation Road EOD area, Water Pump Station #1, Jupiter Crash Site, and the Security Confidence Course. Of

particular concern in these areas is the residue from the solid motors (carbon/graphite) which is a known skin irritant. The base IRP support staff should be contacted prior to working in these areas to determine any special work procedures and PPE that may be required in these areas.

### 3.2 CHEMICAL HAZARDS

Table 3.2 lists chemical constituents of several chemical compounds and common name products which may have been released or discharged at suspected sites. This table is intended primarily as a cross-reference for chemical constituents of compounds and products (for example, rocket fuels) which are somewhat unique to Cape Canaveral AS and adjoining Air Force facilities. Not all of these are a health and safety exposure concern during field sampling activities. For example, LOX (Liquid Oxygen) is not an exposure concern while sampling, but is included to familiarize the reader with compounds stored at these locations. LOX may be of an explosive concern at active launch complexes, but this would be addressed through site-specific health and safety briefings.

Constituents that are of potential concern from a health and safety exposure perspective are presented in Table 3.3. The compounds listed on this table have either been detected during past environmental investigations or identified during the preliminary site assessment as having been used in the past or present. Other constituents not included in Table 3.3 such as polynuclear aromatic hydrocarbons (PAHs) and semi-volatile organic compounds (SVOCs) associated with fuels may be of concern due to potential trace levels. However, the governing compound from a health and safety exposure perspective for solvent contaminated sites is expected to be vinyl chloride. The PAH and SVOC compounds are, therefore, not included since vinyl chloride protective measures govern. Table 3.3 lists the toxicological as well as physical properties for each contaminant. Information such as the Permissible Exposure Limit (PEL), Threshold Limit Value (TLV), and Immediately Dangerous to Life or Health (IDLH) values are presented, as well as the carcinogenic nature and symptoms of acute exposure. Physical properties such as the odor threshold and other applicable properties (such as ionization potential, vapor pressure, lower explosive limit, upper explosive limit, and flash point) are also noted for each contaminant.

**Table 3.2**  
**Cross-Reference Table for Chemical Constituents**  
**Associated with Chemical Compounds and Common Name Products**

Chemical Compounds and Common Name Products	Chemical Constituents
Aerazine 50 (A50)	UDMH (see Hydrazine and UDMH)
Alcohol Fuel	MMH (see Hydrazine and MMH)
	Methanol (Methyl Alcohol)
	Ethanol (Ethyl Alcohol)
Alodine	Chromium
	Cyanide
Anchem #7/17	Unknown Trade Name
Aneroid-	Dichlorotoluene (Benzldichloride)
Ammonium Hydroxide	Ammonium Hydroxide
Ballastite	Nitroglycerine
	Gun Cotton (Nitrocellulose)
	Aluminum Dust
	Potassium Perchlorate
Carbon Tet	Carbon Tetrachloride
Clear Aqua Cure	Unknown Trade Name
Creosote (Wood Treating)	Creosols
	Aromatic Compounds
	Phenol
	Pentachlorophenol
	Guaiacol
	Pyridine
1,2-Dichloroethene	cis/trans-1,2-Dichloroethylene (1,2-DCE)
Diesel Fuel #2 (DF #2)	Benzene
	Ethylbenzene
	Toluene
	Xylenes
	Various <sup>1</sup>

**Table 3.2 - Continued**  
**Cross-Reference Table for Chemical Constituents**  
**Associated with Chemical Compounds and Common Name Products**

<b>Chemical Compounds and Common Name Products</b>	<b>Chemical Constituents</b>
Freon	Chlorofluorocarbon
Fuming Nitric Acid	Nitric Acid
Gasoline	Ethylene Dibromide (EDB)
	Benzene
	Ethylbenzene
	Toluene
	Xylenes
	Various <sup>1</sup>
	Lead
HAP	Hydroxyl Ammonium Perchlorate
Hydraulic Oil/Fluid	Benzene
	Ethylbenzene
	Toluene
	Xylenes
	Naphthalene
	Metals
	Various <sup>1</sup>
	Hydrazine
	N-Nitrosodimethylamine (NDMA)- breakdown product
	see also UDMH,MMH
Hypalon H6	Toluene
	Xylene
	Methyl Ethyl Ketone
Inhibited Red Fuming Nitric Acid (IRFNA)	Nitric Acid
	Nitrogen Dioxide
Isoprep #177	Unknown Trade Name
Isopropanol (IPA)	Isopropyl Alcohol (IPA)



**Table 3.2 - Continued**  
**Cross-Reference Table for Chemical Constituents**  
**Associated with Chemical Compounds and Common Name Products**

Chemical Compounds and Common Name Products	Chemical Constituents
Jet Propellant (JP-3, JP-4, JP-7), and Kerosene	Benzene Ethylbenzene Toluene Xylenes Petroleum Distillates (Naptha) Various <sup>1</sup>
JP-X	85% JP-4 Benzene Ethyl Benzene Toluene Xylenes Petroleum Distillates (Naptha) Various <sup>1</sup>
LOX	15% UDMH Liquid Oxygen
Lubricants/Lube Oil	Benzene Ethylbenzene Toluene Xylenes Glycol Various <sup>1</sup>
MAB Mixture	Freon Methyl Ethyl Ketone Toluene Mineral Spirits
Metals <sup>3</sup>	Lead (at PAFB Skeet Range) Mercury (at Hangar H)
Methyl Ethyl Ketone (MEK)	2-Butanone (MEK)

**Table 3.2 - Continued**  
**Cross-Reference Table for Chemical Constituents**  
**Associated with Chemical Compounds and Common Name Products**

<b>Chemical Compounds and Common Name Products</b>	<b>Chemical Constituents</b>
Mogas (Automobile Gasoline)	see Gasoline
Mono Methyl Hydrazine (MMH)	MMH Hydrazine N-Nitrosodimethylamine (NDMA)- breakdown product
Nebula EP6F	Unknown Trade Name
Oakite	Unknown Trade Name
Oils	Benzene Ethylbenzene Toluene Xylenes Naphthalene Various <sup>1</sup>
OTTO Fuel	Propylene Glycol Dinitrate Dibutyl Sebacate 2-Nitrodiphenylamine
Paints	Toluene Acetone Lead
Paint Thinner	Mineral Spirits Kerosene Benzene Ethylbenzene Toluene Xylenes Various <sup>1</sup>
Perchloroethylene	Tetrachloroethylene (Tetrachloroethene, PCE)

**Table 3.2 - Continued**  
**Cross-Reference Table for Chemical Constituents**  
**Associated with Chemical Compounds and Common Name Products**

Chemical Compounds and Common Name Products	Chemical Constituents
(Perchloroethene, PCE)	
Polychlorinated Biphenyls (PCB)	Chlorodiphenyl
Potting Compound for Connector	
Sealants	Silica Gel
	Ethylene Glycol
	Benzene
	Ethylbenzene
	Toluene
	Xylenes
	Various <sup>1</sup>
Radiological	Gross Alpha
	Gross Beta
Red Fuming Nitric Acid (RFNA)	Nitric Acid (HNO <sub>3</sub> ) (see IRFNA)
	Nitrogen Dioxide
RP-1 (Rocket Propellant 1)	High Grade Kerosene
Solid/Liquid Propellants	Otto Fuel
	Hydrazine
	IRFNA
Solvents <sup>2</sup>	Acetone
	2-Butanone (MEK)
	Carbon Tetrachloride
	1,1-Dichloroethane (1,1-DCA)
	Cis/trans-1,2-Dichloroethylene (1,2-DCE)
	Methylene Chloride
	Tetrachloroethylene (Tetrachloroethene, PCE)
	1,1,1-Trichloroethane (1,1,1-TCA)
	1,1,2-Trichloroethane (1,1,2-TCA)

**Table 3.2 - Continued**  
**Cross-Reference Table for Chemical Constituents**  
**Associated with Chemical Compounds and Common Name Products**

<b>Chemical Compounds and Common Name Products</b>	<b>Chemical Constituents</b>
"Trich" (Trichloroethene, TCE) Unsymmetrical Dimethyl Hydrazine (UDMH)	Trichloroethylene (TCE)
	Vinyl Chloride (VC)
	Isopropyl Alcohol (IPA)
	Trichloroethylene (TCE)
	1,1-Dimethylhydrazine
Waste Oil	Hydrazine
	N-Nitrosodimethylamine (NDMA)- breakdown product
	Benzene
	Ethylbenzene
	Toluene
	Xylenes
	Petroleum Distillates (Naptha)
	Naphthalene
	Metals (Fe, Cr, Pb)
	PCBs
WD-40	Various <sup>1</sup>
	Trichloroethene (TCE)
	Tetrachloroethene (PCE)
	1,1-Dichloroethene (1,1-DCE)
	cis/trans-1,2-Dichloroethene (c,t-1,2-DCE)
	Benzene
	Ethylbenzene
	Toluene
	Xylenes
	Various <sup>1</sup>

**Table 3.2 - Continued**  
**Cross-Reference Table for Chemical Constituents**  
**Associated with Chemical Compounds and Common Name Products**

<b>Chemical Compounds and Common Name Products</b>	<b>Chemical Constituents</b>
1	Various additional chemicals are potential constituents; however, benzene is the major chemical of concern which has been identified from a health and safety perspective. Additional compounds that are associated with waste fuels (such as 1, 2 Dichlorobenzene and Ethylene Dibromide) are included in Table 3.3.
2	In addition to solvents that were reportedly used at the site, breakdown products such as vinyl chloride may be of concern. Additional compounds that are associated with solvents (such as vinyl chloride and dichloroethene) are included in Table 3.3.

**TABLE 3.3**  
**TOXICOLOGICAL AND PHYSICAL PROPERTIES OF CONTAMINANTS OF CONCERN**  
**CCAS, PAFB, MALABAR**

Compound	Toxicological Properties							Physical Properties			
	PEL <sup>(1)</sup>		TLV <sup>®</sup> (2)		IDLH <sup>(3)</sup>		Routes and Symptoms of Acute Exposure <sup>(3)</sup>	Odor		Chemical and Physical Properties <sup>(3)</sup>	
	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )		Threshold	source		
VOLATILES											
Acetone	1000	2400	750	1780	2,500	-		inhalation, ingestion: eye, nose and throat irritant; headache; dizziness; dermatitis.	2.0	(7)	IP= 9.69 eV, VP=180 mm LEL = 2.5%, UEL = 12.8% FP = 0°F
Benzene	1 (10)	-	10 (0.5**)	32 (1.6**)	500	-	H	inhalation, absorption, ingestion, contact: eye, nose and respiratory irritant; giddiness; headache; nausea; staggered gait; fatigue; anorexia; bone marrow depression; dermatitis; lassitude.	2.0	(7)	IP = 9.24 eV, VP = 75 mm LEL = 1.2%, UEL = 7.8% FP = 12°F

TABLE 3.3 - Continued  
TOXICOLOGICAL AND PHYSICAL PROPERTIES OF CONTAMINANTS OF CONCERN  
CCAS, PAFB, MALABAR

Compound	Toxicological Properties							Routes and Symptoms of Acute Exposure <sup>(3)</sup>	Physical Properties		
	PEL <sup>(1)</sup>		TLV® <sup>(2)</sup>		IDLH <sup>(3)</sup>		Carcino- genicity		Odor Threshold		Chemical and Physical Properties <sup>(3)</sup>
	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )			ppm	source	
2-Butanone (MEK) (Methyl Ethyl Ketone)	200	590	200	590	3000	-		inhalation ingestion: eye, skin and nose irritant; headache; dizziness; vomiting.	5.0	(7)	IP = 9.54 eV, VP = 78 mm LEL (200°F) =1.4%, UEL (200°F)=11.4%, FP = 16°F
Chlorobenzene	75	350	10	46	1000	-		inhalation, contact, ingestion: central nervous system depressant; nausea; vomiting; liver, kidney damage; skin irritant.	0.2	(7)	IP = 9.07 eV VP (77°F) = 9 mm LEL = 1.3% UEL = 9.6% FP = 82°F
1,1-Dichloroethane	100	400	100	405	3000	-	A	inhalation, contact ingestion: skin irritant; central nervous system; depressant; liver, kidney damage, lung damage.	5.0	(7)	IP = 11.06 eV, VP (77°F) = 182 mm, LEL = 5.4% UEL = 11.4%, FP = 2°F

**TABLE 3.3 - Continued**  
**TOXICOLOGICAL AND PHYSICAL PROPERTIES OF CONTAMINANTS OF CONCERN**  
**CCAS, PAFB, MALABAR**

Compound	Toxicological Properties							Physical Properties		
	PEL <sup>(1)</sup>		TLV <sup>ⓐ(2)</sup>		IDLH <sup>(3)</sup>		Routes and Symptoms of Acute Exposure <sup>(3)</sup>	Odor Threshold		Chemical and Physical Properties <sup>(3)</sup>
	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )		ppm	source	
o-Dichlorobenzene	C,50	C,300	25	150	200	-	inhalation, absorption, ingestion, contact: nose and eye irritant; liver and kidney damage; skin blister.	2	(8)	IP = 9.06 eV; VP = 1 mm LEL = 2.2%, UEL = 9.2% FP = 151°F
p-Dichlorobenzene	75	450	10	60	150	-	inhalation, ingestion, contact: head, eye irritation, swelling of periorbital; anorexia, nausea, vomiting; low-weight, jaundice, cirrhosis; liver, kidney damage.	15	(8)	IP = 8.98 eV, VP = 1.3 mm LEL = 2.5%, UEL = ? FP = 150°F
cis/trans-1,2-Dichloroethylene	200	790	200	793	1000	-	inhalation, ingestion: eye irritant; central nervous system depression.	1.0	(7)	IP = 9.65 eV, VP = 180 - 264 mm, LEL = 5.6%, UEL = 12.8%, FP = 39°F



TABLE 3.3 - Continued  
TOXICOLOGICAL AND PHYSICAL PROPERTIES OF CONTAMINANTS OF CONCERN  
CCAS, PAFB, MALABAR

Compound	Toxicological Properties							Physical Properties			
	PEL <sup>(1)</sup>		TLV® <sup>(2)</sup>		IDLH <sup>(3)</sup>		Routes and Symptoms of Acute Exposure <sup>(3)</sup>	Odor Threshold		Chemical and Physical Properties <sup>(3)</sup>	
	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )		Carcinogenicity	ppm		source
Ethylbenzene	100	435	100	434	800	-	inhalation, ingestion: eye and mucous membrane irritant; headache; dermatitis; narcosis; coma.	2.0	(7)	IP = 8.76 eV; VP = 7 mm LEL = 0.8%, UEL = 6.7% FP = 55°F	
Ethylene Dibromide	20 C,30	-	-	-	100	-	H inhalation, absorption, ingestion, contact: eye, skin and respiratory system irritant; carcinogen; liver, heart, spleen, & kidney damage; reproductive effects.	10	(8)	IP = 9.45 eV, VP = 12 mm LEL = NA UEL = NA FP = NA	
Methylene Chloride	25 <sup>(10)</sup>	-	50	174	2300	-	H inhalation, absorption, ingestion, contact: fatigue; weak; sleepiness; light headed; numb limbs; eyes and skin irritant; carcinogen.	200	(7)	IP = 11.32 eV, VP = 350 mm LEL = 13% UEL = 23% FP = 2	

**TABLE 3.3 - Continued**  
**TOXICOLOGICAL AND PHYSICAL PROPERTIES OF CONTAMINANTS OF CONCERN**  
**CCAS, PAFB, MALABAR**

Compound	Toxicological Properties							Physical Properties			
	PEL <sup>(1)</sup>		TLV <sup>(2)</sup>		IDLH <sup>(3)</sup>		Routes and Symptoms of Acute Exposure <sup>(3)</sup>	Odor Threshold		Chemical and Physical Properties <sup>(3)</sup>	
	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )		ppm	source		
Tetrachloroethylene C,200	100	-	25	170	150	-	A	inhalation, absorption, ingestion, contact: eye, nose and throat irritant; nausea; flushed face and neck; vertigo; dizziness; incoordination; headache; somnolence; liver damage; skin erythema.	5.0	(7)	IP = 9.32 eV VP = 14 mm LEL = NA UEL = NA FP = NA
Toluene C,300	200	-	50	188	500	-		inhalation, absorption, ingestion: fatigue; weakness; confusion; euphoria; dizziness; headache; dilated pupils; lacrimation; nervousness; muscle fatigue; insomnia; eye and nose irritant; liver & kidney damage.	2.0	(7)	IP = 8.82 eV VP (65°F) = 20 mm LEL = 1.1% UEL = 7.17% FP = 40°F

TABLE 3.3 - Continued  
TOXICOLOGICAL AND PHYSICAL PROPERTIES OF CONTAMINANTS OF CONCERN  
CCAS, PAFB, MALABAR

Compound	Toxicological Properties							Physical Properties				
	PEL <sup>(1)</sup>		TLV® <sup>(2)</sup>		IDLH <sup>(3)</sup>		Routes and Symptoms of Acute Exposure <sup>(3)</sup>	Odor		Chemical and Physical Properties <sup>(3)</sup>		
	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )		Carcino-genicity	Threshold		ppm	source
1,1,1-Trichloroethane	350	1900	350	1910	700	-		inhalation, contact: kidney and liver damage; skin irritant. <sup>(4)</sup>	-	-	IP = 11.00 eV, VP = 19 mm LEL = 7.5%, UEL = 12.5% FP = none	
1,1,2-Trichloroethane	10	45	10	55	500	-	H	inhalation, absorption, ingestion: eye and nose irritant; central nervous system; depression; liver and kidney damage.	-	-	IP = 11.00 eV, VP = 19 mm LEL = NA, UEL = NA FP = NA	
Trichloroethylene (TCE)	100 C,200	-	50	269	1000	-		inhalation, ingestion, contact: headache; vertigo; visual disturbance; tremors; nausea; somnolence; vomiting; eye & skin irritant; dermatitis; cardiac arrhythmia's; paresthesia; giddiness.	20	(7)	IP = 9.45 eV VP = 58 mm LEL (77°F) = 8% UEL (77°F) = 10.5% FP = 90°F	

**TABLE 3.3 - Continued**  
**TOXICOLOGICAL AND PHYSICAL PROPERTIES OF CONTAMINANTS OF CONCERN**  
**CCAS, PAFB, MALABAR**

Compound	Toxicological Properties							Physical Properties			
	PEL <sup>(1)</sup>		TLV <sup>Ⓢ(2)</sup>		IDLH <sup>(3)</sup>		Routes and Symptoms of Acute Exposure <sup>(3)</sup>	Odor Threshold		Chemical and Physical Properties <sup>(3)</sup>	
	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )		ppm	source		
Vinyl Chloride (VC)	1 <sup>(10)</sup>	-	5	13	-	-	H	inhalation: weakness; abdominal pain; gastrointestinal bleeding; hepatomegaly; pallor of extremities.	260	(9)	IP = 9.99 eV, VP = 760 mm LEL = 3.6%, UEL = 33.0% FP = NA
Xylenes	100	435	100	434	900	-		inhalation, absorption, ingestion, contact; dizziness; excitement; drowsiness; incoordination; staggering gait; eye, nose, and throat irritant; corneal vacuolization; anorexia; nausea; vomiting; abdominal pain; dermatitis.	0.5	(7)	IP = 8.56 eV VP = 9 mm LEL = 0.9% UEL = 6.7% FP (o-, m-, p-isomers) = 90, 82, 81°F

TABLE 3.3 - Continued  
TOXICOLOGICAL AND PHYSICAL PROPERTIES OF CONTAMINANTS OF CONCERN  
CCAS, PAFB, MALABAR

Compound	Toxicological Properties							Physical Properties			
	PEL <sup>(1)</sup>		TLV® <sup>(2)</sup>		IDLH <sup>(3)</sup>		Routes and Symptoms of Acute Exposure <sup>(3)</sup>	Odor Threshold		Chemical and Physical Properties <sup>(3)</sup>	
	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )		Carcino- genicity	ppm		source
SEMIVOLATILES											
Aniline	5	19	2	7.6	100	-	H	inhalation, absorption, ingestion: headache; weak; dizziness; ataxia; dyspnea on effort; tachycardia; eye irritant; carcinogen.	1.0	(7)	IP = 7.70 eV, VP = 0.6 mm LEL = 1.3% UEL = 11% FP = 158°F
Di-n-butyl phthalate	-	5	-	5	-	4000		inhalation, ingestion, contact: irritant-eyes, upper respiratory tract and stomach.	-	-	IP = ?, VP = 0.00007 mm LEL = 0.5%, UEL = ? FP = 315°F
2,4 Dimethylphenol	-	-	-	-	-	-					

**TABLE 3.3 - Continued**  
**TOXICOLOGICAL AND PHYSICAL PROPERTIES OF CONTAMINANTS OF CONCERN**  
**CCAS, PAFB, MALABAR**

Compound	Toxicological Properties							Physical Properties			
	PEL <sup>(1)</sup>		TLV <sup>(2)</sup>		IDLH <sup>(3)</sup>		Routes and Symptoms of Acute Exposure <sup>(3)</sup>	Odor Threshold		Chemical and Physical Properties <sup>(3)</sup>	
	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )		ppm	source		
Naphthalene	10	50	10	52	250	-		inhalation, absorption, ingestion, contact: eye irritation; headache; confusion; excitement; malaise; nausea; vomit; abdominal pain; irritation; bladder; profuse sweat; jaundice; renal shutdown; dermatitis; hemoglobinuria.	0.3	(7)	IP = 8.12 eV · VP = 0.08 mm LEL = 0.9% UEL = 5.9% FP = 174°F
Pentachlorophenol	-	0.5	-	0.5	-	2.5	H	inhalation, absorption, ingestion, contact: eye, nose, throat; sneezing, cough; weak, anorexia, low-weight; sweat; headaches, dizziness; nausea, vomiting; dyspnea, chest pain; high fever; dermatitis.	-	-	IP = NA VP = 0.0001 LEL = NA UEL = NA FP = NA

**TABLE 3.3 - Continued**  
**TOXICOLOGICAL AND PHYSICAL PROPERTIES OF CONTAMINANTS OF CONCERN**  
**CCAS, PAFB, MALABAR**

Compound	Toxicological Properties							Physical Properties			
	PEL <sup>(1)</sup>		TLV® <sup>(2)</sup>		IDLH <sup>(3)</sup>		Routes and Symptoms of Acute Exposure <sup>(3)</sup>	Odor		Chemical and Physical Properties <sup>(3)</sup>	
	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )		Carcino- genicity	Threshold		
									ppm		source
Phenol	5	19	5	19	250	-	inhalation, absorption, ingestion, contact: eye, nose and throat irritant; low weight; muscle ache; liver and kidney damage; skin burns.	0.3	(7)	IP = 8.5 eV, VP = 0.4 mm LEL = 1.8 UEL = 8.6% FP = 175°F	
1,2,4 Trichlorobenzene	-	-	C,5	C,37	-	-	inhalation, absorption, ingestion, contact: eye, skin and respiratory tract irritant; drowsiness; incoordination; unconsciousness.	3	(7)	IP = ? VP = 1 mm LEL = ? UEL = 6.6% (302°F) FP = 222°F	

**TABLE 3.3 - Continued**  
**TOXICOLOGICAL AND PHYSICAL PROPERTIES OF CONTAMINANTS OF CONCERN**  
**CCAS, PAFB, MALABAR**

Compound	Toxicological Properties							Physical Properties			
	PEL <sup>(1)</sup>		TLV® <sup>(2)</sup>		IDLH <sup>(3)</sup>		Routes and Symptoms of Acute Exposure <sup>(3)</sup>	Odor Threshold		Chemical and Physical Properties <sup>(3)</sup>	
	(ppm)	(mg/m³)	(ppm)	(mg/m³)	(ppm)	(mg/m³)		Carcino-genicity	Threshold		
									ppm		source
OTHER											
Baygon	-	-	-	-	-	-	-	-	-	-	
Chlordane	-	0.5	-	0.5	-	10 0	Inhalation, absorption, ingestion; blurred vision, confusion, cough, abdominal pain, nausea, diarrhea, irritability tremors, convulsions; lung, liver & kidney damage.	-	-	VP = 0.00001 mm IP = ? UEL = NA LEL = NA	
Cyanide	-	5	-	5***	-	50	inhalation, absorption, ingestion, contact: asphy and death; weak; headache; confusion; vomit; increase respiratory rate; slow gasping respirator; skin and eye irritation.	-	-	IP = NA VP = 0 mm LEL = NA UEL = NA FP = NA	
1,1-Dimethylhydrazine	0.5	1	0.01	0.025	15	-	F inhalation, absorption, ingestion, contact: eye and skin irritant; choking; chest pain; dyspnea; lethargy; nausea; anoxia; convulsions; injury (carcinogen)	< 1 (7) 0		IP = 8.05 eV, VP = 157 mm LEL = 2% UEL = 95% FP = 5°F	



TABLE 3.3 - Continued  
TOXICOLOGICAL AND PHYSICAL PROPERTIES OF CONTAMINANTS OF CONCERN  
CCAS, PAFB, MALABAR

Compound	Toxicological Properties							Physical Properties		
	PEL <sup>(1)</sup>		TLV® <sup>(2)</sup>		IDLH <sup>(3)</sup>		Routes and Symptoms of Acute Exposure <sup>(3)</sup>	Odor		Chemical and Physical Properties <sup>(3)</sup>
	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )		Threshold		
								ppm	source	
2,4-D	-	10	-	10	-	10 0	Inhalation, absorption, ingestion; eye & skin irritation; weakness, stupor, convulsions, hyporeflexia, muscle twitching.	-	-	IP = ? VP = 0.4 mm (320°F)
Diacron	-	-	-	-	-	-	-	-	-	-
Diazinon	-	-	-	0.1	ND	-	Inhalation, absorption, ingestion; eye irritation, blurred vision, dizziness, confusion, weakness, convulsions, abdominal cramps, nausea.	-	-	IP = ? UEL = ? LEL = ? VP = 0.0001 mm

TABLE 3.3 - Continued  
TOXICOLOGICAL AND PHYSICAL PROPERTIES OF CONTAMINANTS OF CONCERN  
CCAS, PAFB, MALABAR

Compound	Toxicological Properties							Physical Properties		
	PEL <sup>(1)</sup>		TLV <sup>®</sup> (2)		IDLH <sup>(3)</sup>		Routes and Symptoms of Acute Exposure <sup>(3)</sup>	Odor Threshold		Chemical and Physical Properties <sup>(3)</sup>
	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )		ppm	source	
Diquat	-	-	-	0.5**** 0.1****	-	-	-	-	-	-
Hydrazine	1	1.3	0.01	0.013	50	-	E inhalation, ingestion, absorption, contact: eyes; nose; throat irritant; nausea; dermatitis; skin burns; temporary blindness; dizziness; eyes (carcinogen). in animals: bronchitis; pulmonary edema; liver and kidney damage.	3.0	(7)	IP = 8.93 eV VP = 10 mm LEL = 2.9% UEL = 98% FP = 99°F
Isopropyl Alcohol	400	980	400	983	2000	-	inhalation, ingestion, contact: mild irritation eyes, throat and nose; drowsiness; dizziness; headache; dry cracking skin.	50.0	(7)	IP = 10.10 eV, VP = 33 mm LEL = 2%, UEL = 12.7% FP = 53°F

TABLE 3.3 - Continued  
TOXICOLOGICAL AND PHYSICAL PROPERTIES OF CONTAMINANTS OF CONCERN  
CCAS, PAFB, MALABAR

Compound	Toxicological Properties							Physical Properties			
	PEL <sup>(1)</sup>		TLV® <sup>(2)</sup>		IDLH <sup>(3)</sup>		Routes and Symptoms of Acute Exposure <sup>(3)</sup>	Odor Threshold		Chemical and Physical Properties <sup>(3)</sup>	
	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )		Carcino- genicity	ppm		source
Malathion	-	15	-	10	-	2 5 0	Inhalation, absorption, ingestion; eye irritation, aching eyes, blurred vision, lacrimation, nausea, abdominal cramps, diarrhea, giddiness, confusion, headache, chest tightness, wheezing.	-	-	FL.P. = >325°F UEL = ? LEL = ? IP = ?	

**TABLE 3.3 - Continued**  
**TOXICOLOGICAL AND PHYSICAL PROPERTIES OF CONTAMINANTS OF CONCERN**  
**CCAS, PAFB, MALABAR**

Compound	Toxicological Properties							Physical Properties		
	PEL <sup>(1)</sup>		TLV <sup>®</sup> (2)		IDLH <sup>(3)</sup>		Routes and Symptoms of Acute Exposure <sup>(3)</sup>	Odor Threshold		Chemical and Physical Properties <sup>(3)</sup>
	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )		ppm	source	
Lead	-	0.05 <sup>(10)</sup>	-	0.05	-	100	inhalation, ingestion, contact, weakness, lassitude, insomnia, facid pallor, anorexia, low weight, malnutrition, constipation, abdominal pain, colic, anemia, gingival lead line, pal eye, tremor, paralysis (wrist, ankles), encephalopathy, kidney disease, irritation of eyes, hypotension	-	-	IP = ? VP = <3x10 <sup>-7</sup> mm LEL = NA UEL = NA FP = NA

TABLE 3.3 - Continued  
TOXICOLOGICAL AND PHYSICAL PROPERTIES OF CONTAMINANTS OF CONCERN  
CCAS, PAFB, MALABAR

Compound	Toxicological Properties							Physical Properties		
	PEL <sup>(1)</sup>		TLV® <sup>(2)</sup>		IDLH <sup>(3)</sup>		Routes and Symptoms of Acute Exposure <sup>(3)</sup>	Odor		Chemical and Physical Properties <sup>(3)</sup>
	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )		Threshold	source	
							Carcino-genicity			
Mercury	-	1.0, C	-	0.01 (alkyl cmpnds) 0.1 (anyl cmpnds) 0.025 (inorg. Forms incl. Metallic mercury	-	10 2 (alkyl cmpnds)	inhalation, absorption, contact: cough, chest pain, dyspnea, bronchitis, pneuitis; tremor, insomnia; irritability, indecision; headache, fatigue, weakness; stomatitis, salivation; GI disturbance, anorexia, low-weight; proteinuria; irritation eyes, skin.	-	-	IP = ? VP = 0.0012 mm LEL = NA UEL = NA FP = NA
Methyl Alcohol	200	260	200	260	6000	-	inhalation, absorption, ingestion, contact: eye, skin and upper respiratory system irritation; headache; drowsiness; light headed; nausea; vomit; disturbance; blindness.	10.0	(7)	IP = 10.84 eV VP = 96 mm LEL = 6% UEL = 36% FP = 52°F

**TABLE 3.3 - Continued**  
**TOXICOLOGICAL AND PHYSICAL PROPERTIES OF CONTAMINANTS OF CONCERN**  
**CCAS, PAFB, MALABAR**

Compound	Toxicological Properties							Physical Properties		
	PEL <sup>(1)</sup>		TLV <sup>®</sup> (2)		IDLH <sup>(3)</sup>		Routes and Symptoms of Acute Exposure <sup>(3)</sup>	Odor Threshold		Chemical and Physical Properties <sup>(3)</sup>
	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )		ppm	source	
Methyl Hydrazine	C,0.2	C,0.35	0.01	0.019	20	-	H inhalation, absorption, ingestion, contact: skin & eye irritant; vomit; diarrhea; respiratory system irritant; tremors; ataxia; anoxia; cyanosis; convulsions (carcinogen).	-	-	IP = 8.00 eV, VP = 38 mm LEL = 2.5% UEL = 92% FP = 17°F
Nitric Acid	2	5	2	5.2	25	-	inhalation, ingestion, contact: eye irritant; mucus membrane and skin irritant; delayed pulmonary; edema; pneumonitis; bronchitis; dental erosion.	<5.0	(7)	IP = 11.95 eV, VP = 48 mm LEL = NA UEL = NA FP = NA
N-Nitrosodimethylamine	-	-	-	-	-	-	H inhalation, absorption, ingestion, contact: nausea; vomit; diarrhea; abdominal cramps; headache; fever; enlarged liver; jaundice; reduced function of liver; kidneys and lungs carcinogen.	-	-	IP = 8.69 eV VP = 3 mm LEL = ? UEL = ? FP = ?

TABLE 3.3 - Continued  
TOXICOLOGICAL AND PHYSICAL PROPERTIES OF CONTAMINANTS OF CONCERN  
CCAS, PAFB, MALABAR

Compound	Toxicological Properties							Physical Properties		
	PEL <sup>(1)</sup>		TLV <sup>®(2)</sup>		IDLH <sup>(3)</sup>		Routes and Symptoms of Acute Exposure <sup>(3)</sup>	Odor Threshold		Chemical and Physical Properties <sup>(3)</sup>
	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )		ppm	source	
PCB 1242 - Chlorodiphenyl (42% chlorine)	-	1	-	1	-	5	H inhalation, absorption, ingestion, contact: eye irritant; chloracne; liver damage; reproductive effects.	-	-	IP = ?, VP = 0.001 mm LEL = NA, UEL = NA FP = NA
PCB 1254 - Chlorodiphenyl (54% chlorine)	-	0.5	-	0.5	-	5	H inhalation, absorption, ingestion, contact: eye and skin irritant; acne-form dermatitis; in animals: liver damage; reproductive effects.	-	-	IP = ?, VP = 0.00006 mm LEL = NA UEL = NA FP = NA
Pratol	-	-	-	-	-	-	-	-	-	-
Propylene Glycol Dinitrate	-	-	0.05	0.34	-	-	inhalation, absorption, ingestion: nasal congestion; headache; dizziness.	-	-	VP = 0.07 mm

**TABLE 3.3 - Continued**  
**TOXICOLOGICAL AND PHYSICAL PROPERTIES OF CONTAMINANTS OF CONCERN**  
**CCAS, PAFB, MALABAR**

Compound	Toxicological Properties							Physical Properties		
	PEL <sup>(1)</sup>		TLV <sup>(2)</sup>		IDLH <sup>(3)</sup>		Routes and Symptoms of Acute Exposure <sup>(3)</sup>	Odor Threshold		Chemical and Physical Properties <sup>(3)</sup>
	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )		ppm	source	
Pyridine	5	15	5	15	1000	-	inhalation, absorption, ingestion, contact: headache, nervousness, dizziness, insomnia; nausea, anorexia; urine frequently; eye irritant; dermatitis; liver and kidney damage.	0.01	(7)	IP = 9.27 eV, VP = 20 mm LEL = 1.8% UEL = 12.4% FP = 68°F
Silica Gel	-	-	-	10	-	3000	inhalation: pneumoconiosis; eye irritant	-	-	IP = NA, VP = 0 mm LEL = NA, UEL = NA FP = NA
Sodium Hydroxide	-	2	-	C,2	-	10	inhalation, ingestion, contact: eye, skin, mucus membrane irritant; pneumonitis; burns eyes and skin; temporary loss of hair.	-	-	IP = NA, VP = 0 mm LEL = NA, UEL = NA FP = NA



TABLE 3.3 - Continued  
TOXICOLOGICAL AND PHYSICAL PROPERTIES OF CONTAMINANTS OF CONCERN  
CCAS, PAFB, MALABAR

Compound	Toxicological Properties							Routes and Symptoms of Acute Exposure <sup>(3)</sup>	Physical Properties		
	PEL <sup>(1)</sup>		TLV® <sup>(2)</sup>		IDLH <sup>(3)</sup>		Odor Threshold		Chemical and Physical Properties <sup>(3)</sup>		
	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )	Carcino- genicity			ppm	source
Sulfuric Acid	-	1	-	1	-	15	inhalation, ingestion, contact: eye, nose, throat, & skin irritant; pulmonary edema; bronchitis; emphysema; conjunctivitis stomatis; dental erosion; trachbronchitis; skin/eye burns; dermatitis.	-	-	IP = NA VP = 0 mm LEL = NA UEL = NA FP = NA	
Vapona	-	-	-	-	-	-	-	-	-	-	

(1) 29 Code of Federal Regulations Part 1910, Revised as of July 1, 1992, 1910.1000, Air Contaminants, January 1997.

(2) 1996 *Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices*, American Conference of Governmental Industrial Hygienists, 1996.

(3) National Institute for Occupational Safety and Health (NIOSH) pocket Guide to Chemical Hazards, June 1994.

(4) Oil and Hazardous Materials - Technical Assistance Data Base.

(5) *Handbook of Toxic and Hazardous Chemicals and Carcinogens*, 2nd Ed., Noyes Publications, New Jersey, 1985.

(6) *Dangerous Properties of Industrial Materials*, 7th Ed., Von Nostrand Reinhold, New York, 1989.

(7) *Fundamentals of Industrial Hygiene*, 3rd Ed., National Safety Council, 1988, pp 817-833

(8) *Occupational Health Guidelines for Chemical Hazards*, NIOSH/OSHA, 1988.

(9) *Hazardous Chemicals Data Book*, 2nd Edition, 1986.

(10) 8-hr time weighted average.

**TABLE 3.3 - Continued**  
**TOXICOLOGICAL AND PHYSICAL PROPERTIES OF CONTAMINANTS OF CONCERN**  
**CCAS, PAFB, MALABAR**

Compound	Toxicological Properties							Physical Properties		
	PEL <sup>(1)</sup>		TLV <sup>(2)</sup>		IDLH <sup>(3)</sup>		Routes and Symptoms of Acute Exposure <sup>(3)</sup>	Odor Threshold		Chemical and Physical Properties <sup>(3)</sup>
	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )		ppm	source	

PEL-Permissible Exposure Limit

TLV-Threshold Limit Value

IDLH- Immediately Dangerous to Life or Health

A -Animal Carcinogen

C -Ceiling Limit

H -Suspected or confirmed human carcinogen

IP-Ionization potential

VP- Vapor pressure at 68°F unless otherwise stated

LEL-Lower explosive limit in air, % by volume (at room temperature)

UEL-Upper explosive limit in air, % by volume (at room temperature)

FP-Flash Point

NA-Not Applicable

- -Not available

• -Coal tar pitch volatile

? -Unknown

\*\* Trial Limits: Substance which either limit has been proposed for the first time, for which a change in the "adopted" listing has been proposed, or for which retention on the Notice of Intended Changes has been proposed (1996).

\*\*\* - 1992-1993 value, parameter not listed in the 1996 TLV guide.

TABLE 3.3 - Continued  
TOXICOLOGICAL AND PHYSICAL PROPERTIES OF CONTAMINANTS OF CONCERN  
CCAS, PAFB, MALABAR

Compound	Toxicological Properties							Routes and Symptoms of Acute Exposure <sup>(3)</sup>	Physical Properties		
	PEL <sup>(1)</sup>		TLV® <sup>(2)</sup>		IDLH <sup>(3)</sup>		Carcino- genicity		Odor		Chemical and Physical Properties <sup>(3)</sup>
									Threshold		
	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )			ppm	source	

\*\*\*\* - 0.5 as inhalable particulate, 0.1 respirable fraction of particulate matter (see TLV guide)

Definitions of selected symptoms:

anorexia abnormal lack of appetite

arrhythmia-absence of rhythm; irregularity

bronchitis-inflammation of the membrane lining of the bronchial tubes

cyanosis-bluish, grayish or purple discoloration of the skin

dermatitis-inflammation of the skin

dyspnea-labored or difficult breathing

edema-excessive fluid in body cavities or tissues

emphysema-abnormal distention of part of the body, especially the lungs, with air or gas

erythema-abnormal redness of the skin

euphoria-an exaggerated feeling of well-being

fibrosis-the development of excess fibrous tissue in an organ

gastritis-inflammation of the stomach

gastroenteritis-inflammation of the stomach and intestinal tract

hepatomegaly-enlargement of the liver

**TABLE 3.3 - Continued**  
**TOXICOLOGICAL AND PHYSICAL PROPERTIES OF CONTAMINANTS OF CONCERN**  
**CCAS, PAFB, MALABAR**

Compound	Toxicological Properties							Physical Properties		
	PEL <sup>(1)</sup>		TLV <sup>®(2)</sup>		IDLH <sup>(3)</sup>		Routes and Symptoms of Acute Exposure <sup>(3)</sup>	Odor Threshold		Chemical and Physical Properties <sup>(3)</sup>
	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )	(ppm)	(mg/m <sup>3</sup> )		ppm	source	
hypokalemia-extreme potassium depletion in the blood resulting in muscular weakness or paralysis										
hypotension-decrease of blood pressure below normal										
lacrimation-secretion and discharge of tears										
lassitude-weariness of body or mind, as from strain										
narcosis-unconsciousness produced by a narcotic drug										
paresthesia-abnormal sensations without cause (e.g., numbness, tingling)										
pneumonia-acute inflammation of the lungs										
polyneuropathy-disorder of the peripheral nerves										
proteinuria-protein, usually albumin, in the urine										
psychosis-any major severe form of mental disorder or disease affecting the personality										
somnolence-extreme drowsiness										
vertigo-a disordered feeling a person has that his surroundings are whirling about										

## SECTION 4 PERSONAL PROTECTIVE REQUIREMENTS

This section describes the levels of protection that are planned for the field effort, including methods of selecting the protection level, emergency equipment, and monitoring requirements.

### 4.1 LEVELS OF PROTECTION

Level B, C, or D protection will be implemented for this project. Most activities are anticipated to occur in Level D. All personal protective equipment used during the course of this project must meet the following applicable OSHA regulations:

<u>Type of Protection</u>	<u>Regulation</u>	<u>Source</u>
Eye and face	29 CFR 1910.133	ANSI Z87.1
Respiratory	29 CFR 1910.134	ANSI Z88.2
Head	29 CFR 1910.135	ANSI Z89.1
Foot	29 CFR 1910.136	ANSI Z41.1

ANSI = American National Standards Institute

The following describes equipment for each level of protection.

#### 4.1.1 Level D Protection

Level D protection consists of the following:

- disposable coveralls (e.g., Tyvek) or cotton clothing (long pants and shirt; short sleeve shirt may be worn if no dermal hazard is present),
- steel-toe safety boots,
- polyvinyl chloride (PVC) gloves,
- safety goggles (during drilling and if splash hazard is present),
- hard hat whenever near heavy equipment,

- ear protection (as needed).

#### **4.1.2 Level C Protection**

Level C protection consists of wearing a full-face air-purifying respirator with combination organic vapor and high efficiency particulate air (HEPA) cartridges. Both the respirators and chemical cartridges must be NIOSH and MSHA approved. Air purifying respirators cannot be used under the following conditions:

- oxygen deficiency (ambient atmosphere contains less than 19.5 percent oxygen),
- IDLH concentration (see Table 3.3), and
- contaminant levels exceed designated maximum use concentrations (protection factor of respirator x PEL).

Individuals who use respirators must wear a respirator that has been successfully fitted to their faces. An improperly fitted respirator provides little respiratory protection. In addition to the respiratory protection, Level C includes the following protective equipment:

- hooded chemically-resistant clothing (e.g., Saranex®),
- inner gloves, (type of glove
- outer gloves, chemical dependent)
- safety boots with disposable boot covers,
- hard hat whenever near heavy equipment,
- ear protection whenever near heavy equipment.

#### **4.1.3 Level B Protection**

Level B protective equipment is the same as Level C, except that the respiratory protection used is a positive pressure full-face self-contained breathing apparatus (SCBA) or a positive pressure air line respirator with escape SCBA.

### **4.2 SELECTION OF LEVELS OF PROTECTION**

As described in Section 3, a variety of potential contaminants of concern have been identified at the sites. For health and safety purposes, the contaminants have been

grouped into several main categories. The categories include solvents (such as trichloroethene and vinyl chloride), benzene (at potential fuel and waste oil contaminated sites), metals, PCBs, hydrazine, and Otto fuel.

#### **4.2.1 General Protection and Monitoring Requirements**

At all sites, measures will be taken to minimize personnel exposure and implement protective actions. Direct reading instruments may be used to rapidly detect flammable or explosive atmospheres and certain gases and organic vapors. Direct reading instruments provide information at the time of sampling, thus enabling rapid decision-making. At all sites, gases and organic vapors shall be monitored in the breathing zone and work area to determine the level of protection required.

Initial site monitoring requirements will be required whenever Level B or C protection is anticipated. Site work zones will be established based on the ambient air monitoring results in the breathing zone and the type of activities that are to be performed.

Periodic air monitoring will be performed when:

- a monitoring well is opened,
- a different type of operation is initiated (e.g., groundwater sampling as opposed to drilling),
- the weather conditions change,
- work begins on a different portion of the site, and
- at five foot intervals during boring activities.

Air monitoring will be conducted using the following equipment:

- properly calibrated OVA, flame-ionization detector or (FID) or photo-ionization detector (PID), to monitor for organic vapors,
- combustible gas indicator to measure the concentration of combustible gases or vapors,
- biosensor to measure the concentration of oxygen,

- mercury vapor indicator,
- hydrazine personal monitoring badges, and
- benzene and vinyl chloride Dräger tubes.

All monitoring equipment and apparatus must be properly calibrated and maintained per manufacturers specification. A calibration and maintenance log will be kept in the field office for all monitoring equipment. Information concerning the operation, calibration, and maintenance of OVAs, and combustible gas indicator can be found in Appendix A.

The following measures will be used to minimize the potential for fires or explosions due to combustible gases:

<b>Combustible Gas Indicator Reading (% Lower Explosive Limit)</b>	<b>Level of Action</b>
Below 10%	Continue Operation
Above 10% but <20%	Stop work and take corrective action (such as non-sparking tools)
Above 20%	Stop working and evacuate the area

In boreholes with high vapor concentrations, the well will be flushed with nitrogen gas or vented to reduce the concentration of contaminants. This will help allow all activities to be conducted safely in Level D.

#### **4.2.2 Volatile Organic Monitoring**

At each site, indicator compounds should be used to determine levels of protection. The indicator is the chemical of concern at the site with the lowest Permissible Exposure Limit (PEL).

#### **Fuel Contaminated Sites (Benzene)**

At sites where fuels or oils are of potential concern, benzene has been chosen as the indicator compound for the fuel constituents. An OVA (FID or PID) will be required for monitoring employee exposure at petroleum product sites. In addition benzene colorimetric tubes (e.g., Dräger) may also be required. The OVA is used to evaluate total fuel vapor concentration whereas the colorimetric tubes are to assure compliance with the



benzene permissible exposure limits. Colorimetric tubes must be capable of detecting 1 ppm benzene. All air readings are to be collected in the worker's breathing zone.

Action levels for benzene are as follows:

Level D protection shall only be used when:

- total fuel vapor readings on the OVA (or HNu) are between 0-25 meter units (mu; ppm methane equivalents), and
- benzene concentration is less than 1 ppm.

Benzene colorimetric tube monitoring is required when the total fuel vapor concentration exceeds 5 mu (ppm methane equivalents) for 30 seconds.

Level C protective ensemble must be donned when:

- total fuel vapor readings in the breathing zone are 25-50 mu (ppm methane equivalents) for 30 seconds, and
- benzene concentration is less than 1 ppm.

The on-site H&S officer may either evacuate workers or upgrade to a Level B protective ensemble when:

- total fuel vapor readings in the breathing zone are between 50-500 mu (ppm methane equivalents) for 30 seconds, or
- benzene exposure is above 1 ppm

Work at the site must be stopped when total vapor concentration exceeds 500 mu (ppm methane equivalents).

For sites where compounds other than benzene are also of concern, additional protective measures which will be implemented are described below.

### **Solvent Contaminated Sites (Vinyl Chloride)**

At sites where "solvents" were identified as of concern, several solvents may have been used. In addition to solvents which are known to have been used (such as TCE) degradation products such as vinyl chloride (VC) may be present. VC is of higher concern than TCE for health and safety purposes. As a result, at sites where solvents are of concern, VC will be used as the indicator compound for solvents for health and safety purposes. Vinyl chloride action levels are as follows:

<b><u>Concentration of Organic Vapors (In the Breathing Zone)</u></b>	<b><u>Level of Respiratory Protection<sup>(1)</sup></u></b>
0 - 1 ppm	Level D
1 - 10 ppm	Level C
10 - 1,000 ppm	Level B
> 1,000 ppm	Stop work; reevaluate activities at site area.

- (1) OSHA requires that the organic cartridges used for VC provide a service life of at least 1 hour at 10 ppm VC.

For sites where both fuels (e.g., benzene) and solvents (e.g., vinyl chloride) are of concern, Draeger tubes may be used for each compound to determine if elevated breathing zone organic vapor readings require implementing personnel protective measures (e.g., Level B or C).

#### **4.2.3 Hydrazine Monitoring**

At all sites where hydrazine is of potential concern, personal hydrazine indicator badges or tubes will be used. Work will stop, and the personal protective equipment will be upgraded to Level B, or engineering controls will be utilized when a concentration of 0.1 ppm of hydrazine is exceeded for 15 minutes.

#### **4.2.4 Metals and PCBs Monitoring**

Metals are not generally expected to present an inhalation hazard unless they are present in a particulate form. Appropriate respirators will be used at any site where particulate metals are potentially present. Particular attention shall be paid to metals inhalation potential during soils sampling or excavation activities, and proper precautions taken.

Mercury vapors may present a hazard at some sites and present an inhalation concern. A mercury vapor detector will be used before entering areas where mercury contamination is suspected. Action levels for mercury are as follows:

<b>Concentration of Mercury Vapors (In the Breathing Zone)</b>	<b>Level of Respiratory Protection</b>
0 - 0.05 mg/m <sup>3</sup>	Level D
0.05 - 0.5 ppm	Level C*
0.5 - 28 ppm	Level B
> 28 ppm	Stop work

\* End of service life indicator (ESLI) on cartridge required.

Site personnel should conduct sampling at all sites with potential Mercury hazards with proper PPE (ie., gloves, protective suits, etc.) in order to avoid dermal contact with contaminated materials.

PCB wipes may be planned for areas where PCBs are of concern. Because these activities do not involve dust generation, PCBs are not expected to be an inhalation hazard. Soil sampling locations where PCBs are suspected or known in soils, inhalation potential may exist and proper precautions should be taken.

#### **4.2.5 Otto Fuel Monitoring**

Otto fuel may be a potential compound of concern at some sites. Otto fuel is of particular concern from a health and safety perspective because of propylene glycol-dinitrate (PGDN). If organic vapor concentrations below 0.05 ppm are detected in the breathing zone, Level D protection is adequate. If readings above 0.05 ppm background are detected, Level B protection is required. Level C respiratory protection shall not be used with Otto fuel due to its poor warning properties (i.e., low odor threshold when compared to its TLV). To measure this low concentration, the Navy has developed the Otto Fuel II Detector Mk 15 Mod O for checking the atmospheric concentration of PGDN. Monitoring shall be conducted by qualified Navy personnel who have been trained in the proper use, calibration and maintenance of the Otto Fuel II Detector. Prior arrangements will be made with the Navy by the CCAS Point-of-Contact to arrange for a Navy representative to utilize this or similar equipment at the time of sampling in the vicinity of Otto fuel sumps or storage areas. In addition to these action levels for respiratory and personal protection, extreme care should be taken to minimize all contact

with soils and water that is potentially contaminated with Otto fuel. Contact with this compound can cause severe skin burns and therefore should be avoided.

#### 4.2.6 Other Concerns

A radiological survey will be conducted by either Parsons ES or CCAS personnel prior to the initiation of sampling activities at any site used for storage or handling of radioactive materials or waste.

### 4.3 EMERGENCY EQUIPMENT

An emergency equipment station will be established at each on-site field work area where drilling or sampling activities occur. The following equipment will be included at emergency stations or with field team kits.

<u>Worker Protection Level</u>	<u>Emergency Equipment</u>
Level B or C	Level D equipment plus air horn
Level D	first aid kit
	eyewash station
	10 lb Class A, B and C extinguisher
	portable cellular phone or two-way radio
	map with route to hospital
	emergency phone numbers

These emergency equipment stations will be prominently marked. Section 6 provides a list of emergency contacts and telephone numbers. Maps and directions to hospitals are included in Appendix E.

## **SECTION 5 SITE WORK ZONES**

To reduce the spread of hazardous materials by workers from contaminated areas to clean areas, zones will be delineated at each site where different types of operations will occur. The flow of personnel between the zones should be controlled. The establishment of the work zones will help ensure that personnel are properly protected against the hazards present where they are working, that work activities and contamination are confined to the appropriate areas, and that personnel can be located and evacuated in an emergency. A discussion of several typical work zones follows.

### **5.1 EXCLUSION ZONE**

The exclusion zone is the area where contamination does or could occur. An exclusion zone will be established for all Level C and Level B activities. Access into the exclusion zone will be controlled to ensure that personnel entering the areas are wearing the proper protection (e.g., hard hat, gloves, steel-toed boots, and respirators). Smoking, eating, drinking and the use of contact lenses will not be permitted within the exclusion zone. The perimeter of the exclusion zone will be marked off with barrier tape.

The on-site H&S officer (or field team leader designee) will ensure that entry into any exclusion zone is controlled to make certain that personnel entering this zone use the correct protective equipment. Air monitoring will be performed prior to sampling activities in order to determine the proper protective ensemble to use.

For Level D activities, the immediate work area is the area where contamination does or could occur. Unprotected onlookers should be located 50 feet upwind of the work area.

## 5.2 CONTAMINATION REDUCTION ZONE

The contamination reduction zone will be established by the on-site H&S officer (or designee) as a buffer zone between the exclusion zone and the support zone for all Level C and Level B activities. The contamination reduction zone will be marked off with barrier tape and will contain the personnel and equipment decontamination station described in Section 7. When possible, the contamination reduction zone should be located upwind of the exclusion zone. Smoking, eating, drinking, and the use of contact lenses will not be permitted in the contamination reduction zone.

## 5.3 SUPPORT ZONE

The support zone will include the remaining areas of the job site. Break areas, operational direction and support facilities (to include supplies, equipment storage and maintenance areas) will be located in this area. No equipment or personnel will be permitted to enter the support zone from the contamination reduction zone without passing through the personnel or equipment decontamination station. Smoking, eating, and drinking will be allowed only in this area.

## 5.4 ANTICIPATED WORK ZONE PROTECTION LEVELS

The majority of the work (for example, soil sampling, groundwater and off-gas sampling) that has been planned for this field effort is anticipated to require Level D protection. For Level D activities, a support zone will be located outside the immediate work zone (e.g., no eating or smoking within 50 feet of the sampling activity involving potential contamination). If a higher level of protection is determined to be needed, Level B or C protection will be implemented.

Based on an evaluation of potential hazards, the following levels of personal protection have been designated for the applicable area or task:

<u>Location</u>	<u>Job Function</u>	<u>Level of Protection</u>
Work Zone	Sampling Activities	B, C, D*
Contamination Reduction Zone	Decontamination Activities	D*
Support Zone	Support Activities	None Required

(\*) Anticipated Level of Required Protection.

## **SECTION 6**

### **EMERGENCY CONTACTS AND CONTINGENCY PLAN**

#### **6.1 EMERGENCY CONTACTS**

In the event of any situation of unplanned occurrence requiring assistance, the appropriate contact(s) should be made from the list below. For emergency situations, the field team leader or on-site H&S officer will contact the appropriate response personnel. The project manager shall ensure that the base points-of-contact and the AFCEE TPM are contacted for emergencies requiring assistance. This emergency contacts list will be posted at the field office and must be posted at the job site.

<u>Contingency Contacts</u>	<u>Phone Number</u>
Fire Department	911
Ambulance	911
Police Department	911
Poison Control Center	1-800-282-3171
Medical Services Network Dr. Mitchell	1-800-874-4676, ext. 111

#### **For Major Medical Emergencies (to include contaminated victims)**

##### **At CCAS:**

Cape Canaveral Hospital	(407) 799-7111
• 701 W. Cocoa Beach. Hwy.	24 hours
Cocoa Beach, FL 32931	

**For Minor Medical Care**

**At CCAS:**

Cape Canaveral Dispensary	(407) 853-2223
Facility 49635	Hours: 0730 - 1600
Industrial Area	Mon. thru Fri.

Directions to each of these facilities can be found in Appendix E.

**Parsons ES Contacts**

Parsons ES Project Manager:	Field Office Numbers:
John Mackey	(801) 572-5999 (Salt Lake City)
Parsons Engineering-Science, Inc.	
South Jordan, UT 84095	

Project Health and Safety Officer:	Office Number:
Paul Foote	(801) 572-5999 (Salt Lake City)
Parsons Engineering-Science, Inc.	
406 W. South Jordan Parkway, Suite 300	
South Jordan, UT 84095	

On-Site Health and Safety Officer:	Field Office Number:
	(407) 853-7561 or 62 (Hangar F)

**AFCEE and Base Points-of-Contact**

**AFCEE and Base Points-of-Contact**

James Gonzales (AFCEE TPM)	(210) 536-4324
Mr. Ed Carver (CCAS)	(407) 853-5707
Mr. Mark Kershner (CCAS)	(407) 853-0964

**Cape Support and Security**

Cape Support and No-dig Status	(407) 853-5211
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Call daily for no-dig status information. Call for general support or problems. Notify in the event of a spill for cleanup response.

Systems Security (Restricted Areas)	(407) 853-2154
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Call daily to notify of work activities, especially those after-hours and on weekends.



Weather (407) 853-8485

Law Enforcement (Controlled Areas) (407) 853-2121

Call daily to notify of work activities, especially those after-hours and on weekends.  
Call to unlock Hangar F gate if locked-out.

### **Clearance and Subsurface Problems**

Mr. Roger Atkinson (CCAS Plumbing Clearance) (407) 853-5485

Mr. Rueben Williams (Communications) (407) 853-5461

Call Base Contact for work order and to arrange for and schedule all CCAS clearances for subsurface activities. Notify if subsurface object is struck or damaged while drilling.

## **6.2 CONTINGENCY PLAN**

This section describes contingency plans related to chemical exposures, personal injury, evacuation procedures, and crisis situations. The field team leader and on-site H&S officer shall be notified of any emergencies or hazardous conditions that develop. The project manager shall also be notified.

### **6.2.1 Chemical Exposure**

If a member of the field crew demonstrates symptoms of chemical exposure, the procedures outlined below should be followed:

- Another team member (buddy) should remove the individual from the immediate area of contamination. The buddy should communicate the chemical exposure to the field team leader. The field team leader or on-site H&S officer should contact the appropriate emergency response agency,
- Precautions should be taken to avoid exposure of other individuals to the chemical,
- If the chemical is on the individual's clothing, the chemical should be neutralized or removed if it is safe to do so,
- If the chemical has contacted the skin, the skin should be washed with copious amounts of water,

- In case of eye contact, an **emergency eyewash** should be used. Eyes should be washed for at least 15 minutes,
- All chemical exposure incidents **must** be reported in writing to the project H&S officer. The on-site H&S officer or field team leader is responsible for completing the accident report (see Appendix B).

#### **6.2.2 Personal Injury**

In cases of personal injury at the site, the following procedures should be followed:

- Another team member (buddy) should signal the field team leader that an injury has occurred,
- A field team member trained in **first aid** can administer treatment to an injured worker,
- The victim should then be transported to the nearest hospital or medical center. If necessary, an ambulance should be called to transport the victim,
- The field team leader or on-site H&S officer is responsible for making certain that an accident report form is completed. Follow-up action should be taken to correct the situation that caused the accident.

In cases of venomous snake and spider bites at the site, the personal injury procedures outlined above should be followed. In addition, the victim should be kept still and the area of the body where the bite occurred should be kept below the level of the heart. If possible, the identification of the snake or spider should be noted and reported to the medical personnel treating the victim.

#### **6.2.3 Evacuation Procedures and Emergency Crisis**

Site evacuations will be implemented as follows:

- The field team leader will initiate **evacuation** procedure by signaling to leave the site,
- All personnel in the work area should evacuate the area and meet in the common designated area,

- All personnel expected to be in or near the work area should be accounted for and the whereabouts of missing persons determined immediately; further instruction will then be given by the field team leader.

In the event of a major fire, an explosion, or on-site health emergency crisis, the following shall also be conducted:

- Notify the paramedics and/or fire department, as necessary,
- Isolate the area,
- Stay upwind of any fire,
- Keep area surrounding the problem source clear after the incident occurs,
- Complete accident report form and distribute to appropriate personnel.

## **SECTION 7 DECONTAMINATION**

This section discusses personnel decontamination. Equipment decontamination is discussed in the Field Sampling Procedures (in the Field Sampling Plan). To prevent harmful materials from being transferred into clean areas or from exposing unprotected workers, all field personnel exiting an area of potential contamination will undergo decontamination. The following sections describe Levels D, C and B decontamination, as well as decontamination procedures to be followed during medical emergencies.

### **7.1 LEVEL D DECONTAMINATION**

A modified decontamination procedure will be used for Level D activities. Specifically, personnel will be advised to wash their hands and face following sampling activities prior to eating or smoking. Personnel breaking for lunch will be required to wash hands and face prior to eating. Personnel should shower upon return to their residence at the end of the work day.

### **7.2 LEVEL C DECONTAMINATION**

#### **Station 1: Segregated Equipment Drop**

Deposit equipment used on the site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths or in different containers with plastic liners. Each will be contaminated to a different degree. Segregation at the drop reduces the probability of cross-contamination.

Necessary equipment includes:

1. Containers of various sizes,
2. Plastic liners,
3. Plastic drop cloths.

**Station 2: Suit/Safety Boot Wash/Rinse & Outer-Glove Wash/Rinse/Removal**

Thoroughly wash chemical resistant suit, safety boots and outer gloves. Scrub with long-handle, soft-bristle scrub brush and copious amounts of liquinox/water solution. Repeat as many times as necessary. Rinse off liquinox/water solution using copious amounts of water. Repeat as many times as necessary. Remove the outer gloves and deposit in individually marked plastic bags.

Necessary equipment includes:

1. Container (30 gallon) and spray unit,
2. Liquinox/water (or equivalent) solution,
3. Long-handle soft-bristle scrub brushes,
4. Water,
5. Plastic bag.

**Station 3: Cartridge or Mask Change**

If a worker leaves the exclusion zone to change a cartridge or the mask, this is the last step in the decontamination procedures. The worker's cartridges or mask are exchanged, new outer gloves are donned, and joints are taped. The worker then returns to duty. Otherwise the worker proceeds to Station 4.

Necessary equipment includes:

1. Cartridges or masks,
2. Tape,
3. Boot covers,
4. Gloves.

#### **Station 4: Suit/Safety Boot Removal and Inner-Glove Wash/Rinse**

Remove safety boots and deposit in individually marked plastic bags. With assistance of helper, remove suit. Deposit in container with plastic liner. Wash inner gloves with liquinox/water (or equivalent) solution that will not harm skin. Repeat as many times as necessary. Rinse inner-gloves with water. Repeat as many times as necessary.

Necessary equipment includes:

1. Container (30 gallon),
2. Plastic liners,
3. Bench or stool,
4. Liquinox/water solution,
5. Long-handle soft-bristle brushes,
6. Water.

#### **Station 5: Respirator and Inner-Glove Removal**

Remove face piece. Avoid touching face. Wash face piece in clean, sanitized solution, allow to dry and deposit face piece in plastic bag. Store in clean area. Remove inner gloves and deposit in container with plastic liner.

Necessary equipment includes:

1. Plastic bags,
2. Sanitizing solution,
3. Cotton,
4. Container and Plastic Liners.

#### **Station 6: Field Wash and Redress**

Wash hands and face. If re-entering exclusion zone, put on clean cloths (e.g., Saranex®, gloves, etc.).

Necessary equipment includes:

1. Water,
2. Soap,
3. Tables,
4. Wash basins or buckets,
5. Clean towels,
6. Chairs,
7. Clothing.

### **7.3 LEVEL B DECONTAMINATION**

Decontamination for this level-of-protection will be the same as for Level C except that Station 3 will be an air tank change instead of cartridge changing.

Modifications can be made to either decontamination process depending upon the extent of contamination. The effectiveness of the decontamination process can be checked by visual inspection or by the use of an organic vapor instrument.

### **7.4 DECONTAMINATION DURING MEDICAL EMERGENCIES**

It is possible that decontamination may aggravate or cause more serious health effects during a medical emergency. If prompt life-saving first aid and medical treatment is required, decontamination procedures should be omitted. Whenever possible, personnel should accompany contaminated victims to the medical facility to advise on matters involving decontamination.

#### **7.4.1 Physical Injury**

Physical injuries can range from a sprained ankle to a compound fracture, from a minor cut to severe bleeding. Depending on the seriousness of the injury, treatment may be given at the site by trained personnel. For more serious injuries, additional assistance may be required at the site or the victim may have to be transported to a medical facility.

Life saving care should be started immediately without considering decontamination. The outside garments can be removed if they do not cause delays, interfere with treatment, or aggravate the problem. Respirators and backpack assemblies must always be removed. Chemical-resistant clothing can be cut away. If the outer contaminated garments cannot be safely removed, the individual should be wrapped in plastic, rubber, or blankets to help prevent contaminating medical personnel and the inside of ambulances. Outside garments are then removed at the medical facility. No attempt should be made to wash or rinse the victim at the site. An exception would be if it is known that the individual has been contaminated with an extremely toxic or corrosive material that could also cause severe injury or loss of life. For minor medical problems or injuries, the normal decontamination procedure should be followed.

#### **7.4.2 Heat Stress**

Heat related illnesses range from mild heat fatigue to a serious heat stroke. Heat stroke requires prompt treatment to prevent irreversible damage or death. Unless the victim is obviously contaminated, decontamination should be omitted or minimized and treatment begun immediately. Protective clothing may have to be cut off. The early stages of heat stress require prompt attention because, if ignored, heat stroke can result.

#### **7.4.3 Chemical Exposure**

Exposure to chemicals can be divided into two categories:

- Injuries from direct contact, such as acid burns or inhalation of toxic chemicals,
- Potential injury caused by gross contamination on clothing or equipment.

For inhaled contaminants, treatment can only be performed by qualified physicians. If the contaminant is on the skin or in the eyes, immediate measures must be taken to counteract the substances effect. First aid treatment generally includes flooding the affected area with water. For a few chemicals, water may cause more severe problems.

When protective clothing is grossly contaminated, contaminants may be transferred to treatment personnel or the wearer and cause additional injuries. Unless life threatening problems have occurred simultaneously with splashes, the protective clothing should be washed off as rapidly as possible and carefully removed.



**APPENDIX A**  
**AIR MONITORING EQUIPMENT**  
**OPERATION, CALIBRATION AND MAINTENANCE**

## **APPENDIX A AIR MONITORING EQUIPMENT OPERATION, CALIBRATION AND MAINTENANCE**

All monitoring instruments must be calibrated and maintained periodically. The limitations and possible sources of errors for the instrument must be understood by the operator. It is important that the operator ensures that the instrument responds properly to the substances it was designed to monitor. The operating, calibration and maintenance procedures for the following instruments are described in this Appendix:

- Appendix A.1 - Organic Vapor Analyzer (OVA)
- Appendix A.2 - Hnu (PID)
- Appendix A.3 - Combustible Gas Monitor

**APPENDIX A.1**  
**ORGANIC VAPOR ANALYZER (OVA)**

## **APPENDIX A.1 ORGANIC VAPOR ANALYZER (OVA)**

This section provides precautions, operating procedures, calibration, maintenance, and trouble shooting information for the Foxboro 128GC Organic Vapor Analyzer (OVA). Other OVA instruments may be used and will be operated in accordance with their manuals.

### **PRECAUTIONS**

The following precautions should be followed for best performance of the OVA.

- Keep battery on charger when not in use
- Recharge battery as soon as possible after use (often requires 16 hour charge)
- When OVA pump slows, turn instrument off - completely draining the battery causes permanent damage
- Do not overtighten valves
- Use hydrogen which contains less than 2 ppm hydrocarbons.
- Hydrogen gas mixed with air is extremely flammable. Refilling should take place only in well-ventilated areas, away from sources of sparks, heat or flames.

Please note that an OVA instrument can act like a microwave oven under a radar tower, and personnel should, therefore, not walk or pass under a transmitting tower with an OVA.

### **OPERATING PROCEDURES**

#### **Start Up**

1. Check battery condition by moving the INSTR switch to the BATT position.

2. Move INSTR switch to ON and allow five (5) minutes to warm-up.
3. Use the Calibrate Adjust knob to set the meter needle to the level desired for activating the audible alarm. If this alarm level is other than zero, the Calibrate Switch must be set to the appropriate range.
4. Turn the Volume knob fully clockwise.
5. Using the Alarm Level Adjust knob, turn the knob until the audible alarm is activated.
6. Set CALIBRATE switch to X1 position, use CALIBRATE knob and set meter to read 0.
7. Move PUMP switch to ON position, then place instrument panel in vertical position and check SAMPLE FLOW RATE indication. The normal range is 1.5 to 2.5 units. If less, check filters.
8. Open the HYDROGEN TANK VALVE and the HYDROGEN SUPPLY VALVE. Wait one minute for hydrogen to purge the system.
9. Depress Igniter Button until burner lights. Do not depress Igniter Button for more than six seconds. (If burner does not ignite, let hydrogen flow for one minute and again attempt ignition.)
10. Use CALIBRATE knob to "zero" out ambient background. For maximum sensitivity below 10 ppm, set CALIBRATE switch to X1 and readjust zero on meter. To avoid false flame-out alarm indication, set meter to 1 ppm with CALIBRATE knob and make differential readings from there.

### Measurements

Move probe into sampling area (e.g., breathing zone, borehole, jar headspace, etc.). Note the stabilized reading for breathing and borehole zones. For headspace samples, note the highest needle reading immediately after puncturing the foil.

If the needle is pegged to a maximum reading, switch the scale to ensure an accurate measurement. If a reading above 1 ppm occurs, attach the methane filter to the probe and take a second measurement to correct for methane. Record both measurements.

If the instrument fails to respond during measurements, instrument performance can be checked with the cap of a magic marker to verify that the instrument is operating.

### **Shut Down**

1. Close the HYDROGEN TANK VALVE
2. Move the INSTR switch and PUMP switch to OFF
3. Instrument is now in shut down configuration

### **CALIBRATION**

The OVA calibration shall be checked daily. If the meter does not correctly read the span gas concentration, the following procedure for the calibration (single sample) of the OVA will be performed:

1. Place instrument in normal operation with CALIBRATE switch set to X10 and GAS SELECT control set to 300.
2. Use the CALIBRATE ADJUST (zero knob to adjust the meter reading to zero).
3. Introduce a methane sample of a known concentration (between 90 and 100 ppm not to exceed 100 ppm) and adjust trimpot R-32 so the meter reading corresponds to the known sample.
4. This sets the instrument gain for methane with the panel mounted gain adjustment (GAS SELECT) set at a reference number of 300.
5. Turn off HYDROGEN SUPPLY VALVE to put out flame.
6. Leave CALIBRATE switch on X10 position and use CALIBRATE ADJUST (zero) knob to adjust meter reading to 4 ppm.
7. Place CALIBRATE switch in X1 position and using trimpot R-31 adjust meter reading to 4 ppm.
8. Move CALIBRATE switch to X10 position again. Use CALIBRATE ADJUST (zero) knob to adjust meter to a reading of 40 ppm.

9. Move CALIBRATE switch to X100 position and use trimpot R-33 to adjust meter reading to 40 ppm.
10. Move CALIBRATE ADJUST (zero) knob to adjust meter reading to zero.
11. Unit is now balanced from range to range, calibrated to methane, and ready to be placed in normal services.

## MAINTENANCE

- **Quad Rings.** The quad rings shall be checked weekly. The following steps shall be conducted:
  1. Remove OVA from case.
  2. Remove clip ring from bottom of valve.
  3. Unscrew nut from top of valve.
  4. Gently pull valve shaft upward and free of housing.
  5. Observe rings for signs of damage - replace as necessary.
  6. Lightly grease rings.
  7. Re-assemble valve - do not pinch rings during shaft insertion.
- **Burner Chamber.** The burner chamber shall be cleaned weekly. The following steps shall be conducted:
  1. Remove plastic exhaust port cover.
  2. Unscrew exhaust port.
  3. Use wire brush to clean burner tip and electrode. Use wood stick to clean teflon; avoid touching ignitor.
  4. Brush inside of exhaust port.
  5. Blow out chamber with a gentle air flow.
  6. Re-assemble and test unit.
- **Particle Filters and Pumping System.** The particle filters and pumping system shall be checked daily. The following steps shall be conducted:

1. With pump on, hold unit upright and observe flow gauge.
  2. Ball level significantly below a reading of 2 is low flow.
  3. Clean or replace particle filters.
  4. Re-assemble and retest flow.
  5. If flow is still low, replace pump diaphragm and valves.
  6. If flow is normal, plug air intake. Pump should slow and stop.
  7. If no noticeable change in pump, tighten fittings and retest.
  8. If still no change, replace pump diaphragm and valves.
- **Hydrogen Valve.** The following steps will be conducted for hydrogen valve packing removal:
    1. Remove instrument from case.
    2. Remove valve knobs.
    3. Remove capillary tube.
    4. Remove filler cap and fitting.
    5. Remove three nuts from valves and pull tank assembly from OVA.
    6. Unscrew packing retainer nut from valve to be serviced.
    7. Turn valve shaft counter-clockwise to remove shaft and packing. Replace parts as required.
    8. Re-assemble valve and replace tank assembly in OVA.



**APPENDIX A.2**  
**HNu**

## **APPENDIX A.2**

### **HNu**

The photoionization detector must be calibrated each day prior to field use. A canister of isobutylene calibration gas will be taken into the field to perform this routine calibration check. The procedure for the calibration of an HNu® photoionization detector is listed below.

1. Attach the probe to the readout unit. Match the alignment key, then twist the connector clockwise until a distinct locking is felt.
2. Turn the FUNCTION switch to the battery check position. Check to ensure that the indicator reads within or beyond the green battery arc on the scale plate. If the indicator is below the green arc or if the red LED comes on, the battery must be charged prior to using the instrument.
3. To zero the instrument, turn the FUNCTION switch to the STANDBY position, and rotate the ZERO POTENTIOMETER until the meter reads zero. Wait 15 to 20 seconds to ensure that the zero adjustment is stable. If it is not stable, readjust.
4. Set the FUNCTION switch to the desired ppm range.
5. Listen for the fan operation to verify fan function.
6. Connect one end of the sampling hose to the regulator outlet and the other end to the sampling probe of the HNu®.
7. Open the regulator valve (to calibration gas).
8. Take reading after 5 to 10 seconds.
9. Adjust the span control setting as required to read the ppm concentration of the standard.
10. Results of calibration should be recorded in the logbook.

Recommended maintenance for the HNu® is listed below:

<u>Function</u>	<u>Frequency</u>
Wipe down readout unit	After each use
Clean UV light source window	Every month
Clean ionization chamber	Every month
Recharge battery	Daily or as use dictates

**APPENDIX A.3**  
**COMBUSTIBLE GAS DETECTOR**

## APPENDIX A.3 COMBUSTIBLE GAS DETECTOR

This section provides precautions, operating procedures, calibration, maintenance, and trouble shooting information for the Industrial Scientific Model MX251 Combustible Gas Detector (CGD). Other CGD instruments may be used and will be operated in accordance with their manuals.

### PRECAUTIONS

Silicone compound vapors and sulfur compound vapors will cause desensitization of the LEL detector and thus cause erroneous low determinations. Verify the calibration of an instrument that has been used where these vapors were present before that instrument is relied upon for accurate measurements. Replace the LEL detector if the instrument cannot be calibrated.

- Any rapid up-scale reading followed by a declining or erratic reading, or reading greater than 100% LEL, may indicate a gas concentration beyond the accurate response range of the LEL detector. Either take immediate corrective action to eliminate this potential hazard; or, withdraw from it.
- Obstruction of the screened sensor parts will cause erroneous low readings. These screens must be kept clean.
- (Nicad Battery Users Only). Apparent reductions in battery capacity may result from repetitive use patterns. A fully charged battery that does not deliver energy for at least 10 hours continuous monitoring may have developed a "memory" condition. To eradicate this, entirely discharge the battery (until low battery warning) and then fully recharge the battery.

Once the monitor goes into the battery failure mode, it should be switched off within a few minutes. If the unit is not switched off within 10 minutes,

inaccurate fluctuating readings will appear on the display and serious battery damage may result.

- (Alkaline Battery Users Only). Operating time will be reduced significantly when the temperature is near or below freezing. Always replace all four batteries at the same time.

## **OPERATING PROCEDURES**

### **Start Up**

1. Back off the knurled nut that holds the calibration cover in place.
2. Rotate the cover so that the metal button is inserted in the oval-shaped hole.
3. Tighten the nut until the calibration cover is flush with the case. Do not overtighten.

### **Measurements**

Hold the instrument over or in the area of concern. Press the button to switch between oxygen and % LEL readings. Record both measurements.

### **Shut Down**

1. Back off the knurled nut that holds the calibration cover in place.
2. Rotate the cover so that the metal button is inserted in the unmarked round hole.
3. Tighten the nut until the calibration cover is flush with the case. Do not overtighten.

## **CALIBRATION**

The combustible gas indicator must be calibrated daily. For best calibration accuracy, the monitor should be allowed to stabilize at room temperature for at least one hour before calibration. Before calibrating the instrument, it is good practice to check all of the alarm settings to verify that they are set correctly (the factory setting for the LEL alarm is 10%). The procedure for calibrating the combustible gas monitor is listed below:

1. In clean air, switch the display to the LEL mode and adjust the Z LEL (LEL zero offset) control by turning it counterclockwise until the minus sign (-) appears on the display. Very slowly turn the Z LEL control clockwise until the minus sign just goes off, leaving (000) in the display.
2. Attach the 0.5 liter per minute fixed flow rate regulator to the calibration gas cylinder.
3. Attach a sample line from the regulator to the balloon inlet. Attach another sample line from the balloon outlet to the sample draw intake on the instrument.
4. Fill the balloon with calibration gas and allow the sample draw pump to draw it over the sensors. **DO NOT OVERINFLATE BALLOON!** Feed more gas into the balloon as needed to keep it partially inflated.
5. Wait for the readings to stabilize (approximately 2 minutes). Then, using a small jeweler's screwdriver, adjust the S LEL (LEL span sensitivity) pot to obtain a steady reading which corresponds to the calibration gas concentration that is printed on the label of the calibration gas cylinder. (Normally 50 % LEL)
6. Remove calibration lines.
7. Let the instrument run for one full minute to flush any excess calibration gas and check readings. The combustible sensor should now be reading 000 % LEL, ( $\pm 001$  % LEL), in fresh air. Repeat calibration procedures, if necessary.
8. Combustible calibration complete.
9. Results of calibration must be recorded in the logbook.

## MAINTENANCE

- **LEL Screen Replacement.** A stainless steel screen protects the LEL sensor from direct impact and dust particles.
  1. Remove the four (4) screws that hold the bezel and screen in place.

2. Forced air cleaning may not remove very fine dust particles clogging the screen. NEVER use any type of solvent to clean the screen, since it may degrade sensor performance. A screen that cannot be cleaned should be replaced. See replacement parts list.
  3. Reassemble the screen and bezel to the monitor.
- **Charging Batteries (Nicad Users Only).** Instrument must be turned off before charging. A completely discharged battery's full potential will be restored by 14 hours of charging. When charged for 14 hours, the battery will power the monitor for a minimum of 10 hours. Typical run time will be approximately 12 hours.



**APPENDIX B**  
**HEALTH AND SAFETY FORMS**

## **APPENDIX B HEALTH AND SAFETY FORMS**

This appendix includes the following health and safety forms:

- Appendix B.1 - Accident Report Form
- Appendix B.2 - Plan Acceptance Form
- Appendix B.3 - SCBA and Air Purifying Respiratory Logs
- Appendix B.4 - Project Health and Safety Document Tracking Form

The plan acceptance form shall be signed by each project team member before starting work at any site.

**APPENDIX B.1**  
**ACCIDENT REPORT FORM**

## ACCIDENT REPORT FORM

Project: \_\_\_\_\_

### EMPLOYER

1. Name: \_\_\_\_\_

2. Mail Address: \_\_\_\_\_  
(No. and Street) (City or Town) (State)

3. Location, if different from mail address: \_\_\_\_\_

### INJURED OR ILL EMPLOYEE

4. Name \_\_\_\_\_ Social Security Number: \_\_\_\_\_  
(First) (Middle) (Last)

5. Home Address: \_\_\_\_\_  
(No. and Street) (City or Town) (State)

6. Age \_\_\_\_\_ 7. Sex: Male \_\_\_\_\_ Female \_\_\_\_\_ (Check one)

8. Occupation: \_\_\_\_\_  
(Specific job title, not the specific activity employee was performing at time of injury)

9. Department: \_\_\_\_\_  
(Enter name of department in which injured person is employed, even though they may have been temporarily working in another department at the time of injury)

### THE ACCIDENT OR EXPOSURE TO OCCUPATIONAL ILLNESS

10. Place of accident or exposure: \_\_\_\_\_  
(No. and Street) (City or Town) (State)

11. Was place of accident or exposure on employer's premises? (Yes/No)

12. What was the employee doing when injured? \_\_\_\_\_  
(Be specific - Was employee using tools or

equipment or handling material?)

**ACCIDENT REPORT FORM** *(continued)*

13. How did the accident occur? \_\_\_\_\_  
*(Describe fully the events which resulted in the injury or occupational illness. Tell what happened and how. Name objects and substances involved. Give details on all factors which led to accident. Use separate sheet for additional space.*

14. Time of accident: \_\_\_\_\_

15. Witnesses to accident:

_____	_____	_____
<i>(Name)</i>	<i>(Affiliation)</i>	<i>(Phone No.)</i>
_____	_____	_____
<i>(Name)</i>	<i>(Affiliation)</i>	<i>(Phone No.)</i>
_____	_____	_____
<i>(Name)</i>	<i>(Affiliation)</i>	<i>(Phone No.)</i>

**OCCUPATIONAL INJURY OR OCCUPATIONAL ILLNESS**

16. Describe the injury or illness in detail and indicate the part of the body affected.

\_\_\_\_\_

\_\_\_\_\_

17. Name the object or substance which directly injured the employee. (For example, object which struck employee; the vapor or poison inhaled or swallowed; the chemical or radiation which irritated the skin; or in cases of strains, hernias, etc., the object the employee was lifting, pulling, etc.). \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

18. Date of injury or initial diagnosis of occupational illness: \_\_\_\_\_  
*(Date)*

19. Did the accident result in employee fatality? \_\_\_\_\_ (Yes or No)

**ACCIDENT REPORT FORM** *(continued)*

**OTHER**

20. Name and address of physician: \_\_\_\_\_

21. If hospitalized, name and address of hospital: \_\_\_\_\_

\_\_\_\_\_

Date of report \_\_\_\_\_ Prepared by \_\_\_\_\_

Official position \_\_\_\_\_

**APPENDIX B.2**  
**PLAN ACCEPTANCE FORM**

**PLAN ACCEPTANCE FORM  
PROJECT HEALTH AND SAFETY PLAN**

I have read and agree to abide by the contents of the Health and Safety Plan for the following project:

Groundwater Circulation Well Technology Evaluation and Optimization  
CCAS, FLORIDA

---

Name (print)

---

Signature

---

Date

Return to On-site Health and Safety Officer before starting work at the site.



**APPENDIX B.3**  
**RESPIRATORY LOGS**

## SCBA RESPIRATORY LOGS

SITE: \_\_\_\_\_

LOCATION: \_\_\_\_\_

DATES OF INVESTIGATION: \_\_\_\_\_

<u>User</u>	<u>Date of Use</u>	<u>SCBA#</u>	<u>Satisfactory Check-Out (Yes/No - Initials)</u>	<u>Date Cleaned</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

SCBA Performance Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Project Health and Safety Officer  
or Field Team Leader

\_\_\_\_\_

Date

Return to Office Health and Safety Representative at the completion of field activities.

## AIR PURIFYING RESPIRATOR LOG

SITE: \_\_\_\_\_

LOCATION: \_\_\_\_\_

DATES OF INVESTIGATION: \_\_\_\_\_

<u>User</u>	<u>Date of Use</u>	Cleaned and Inspected Prior to Use (Initials)	Cartridges Changed Prior to Use (Yes/No - N/A)	Total Hours on Cartridge	Date of Last Fit Test
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
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_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

\_\_\_\_\_  
Project Health and Safety Officer  
or Field Team Leader

\_\_\_\_\_  
Date

Return to Office Health and Safety Representative at the completion of field activities.

**APPENDIX B.4**  
**PROJECT HEALTH AND SAFETY DOCUMENT TRACKING**

Project Name: \_\_\_\_\_  
 Project Number: \_\_\_\_\_  
 Project Manager: \_\_\_\_\_  
 Project H&S Officer: \_\_\_\_\_  
 Update Number: \_\_\_\_\_

Project Type (Check One):  
☐ Hazardous Waste  
☐ Industrial Field  
☐ Other \_\_\_\_\_  
 Date Form Completed: \_\_\_\_\_

DOCUMENT DATE (2)										
Parsons ES or Subcontractor (1)	Dates of Field Work	Names of Site Workers	Physical	Respirator Fit Test	Training 24-hour	Training 40-hour	8-hour Update	Parsons ES and Subcontractor HSP	HSP Acceptance Form Sign-off (Parsons ES only)-	Site-specific Training
Parsons ES	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Parsons ES	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____

_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____

(1) List each subcontractor below the double line.

(2) NA – not applicable. Requirements vary depending on project type and potential exposures.

Comment \_\_\_\_\_

**Instructions:** THIS FORM MUST BE COMPLETED BY THE PROJECT MANAGER AND SUBMITTED TO THE OFFICE H&S REPRESENTATIVE PRIOR TO THE INITIATION OF SITE ACTIVITIES. IT MUST BE UPDATED AS NEEDED BY THE PROJECT H&S OFFICER UNTIL COMPLETION OF FIELD WORK. COPIES OF UPDATES MUST BE PROVIDED TO THE OFFICE H&S REPRESENTATIVE. DOCUMENTATION LISTED IN SHADED AREA IS TO BE PLACED IN THE PROJECT H&S FILE. FILES WILL BE AUDITED MONTHLY.

**APPENDIX C**  
**SITE-SPECIFIC SAFETY TRAINING AND INFORMATION**

## **APPENDIX C**

### **SITE-SPECIFIC SAFETY TRAINING AND INFORMATION**

This appendix includes the following information:

- Appendix C.1 - Site-Specific Safety Training Courses
- Appendix C.2 - Active Site Safety Information

**APPENDIX C.1**  
**SITE-SPECIFIC SAFETY TRAINING COURSES**



# **SITE-SPECIFIC SAFETY TRAINING COURSES<sup>1</sup>**

Course	Course Title	Type/Time	Frequency	Applicable Sites
QC295MDA	PSF Orientation	Video/17 Min.	3 Years	GPS PSF (Fac. 55840)
QF04AK5C	Hangar AF Familiarization	Video/10 min.	3 Years	Hangar AF
QF1??PKSC	SLC 17 Safety	Video/12 min.	3 Years	Launch Complex 17
QF200KSC	Liquid Prop. Storage Fac.	Video/14 min.	3 Years	FSA #1
QG106MMC	ITL Orientation	Video/38 min.	3 Years	Launch Complex 40, Launch Complex 41
QG117KSC	SLC 17 Facility Safety Fam	Wlkd/2 Hr.	Initial	Launch Complex 17
QW29BKSC	PSF Walkdown	Wlkd/1 Hr.	Initial	GPS PSF (Fac. 55840)
QW29CKSC	NPF Walkdown	Wlkd/1 Hr.	Initial	GPS PSF (Fac. 55810)
QW29DKSC	SLC 40 Walkdown	Wlkd/2 Hr.	Initial	Launch Complex 40
QW29EKSC	SLC 41 Walkdown	Wlkd/2 Hr.	Initial	Launch Complex 41
QW29HKSC	Area 55 Walkdown	Wlkd/2 Hr.	Initial	Launch Complex 17

1. These courses are offered by the Air Force. The Base Point-of-Contact will notify the Parsons ES Project Manager of which sampling teams; if any, should enroll in such courses on a site-specific basis. The applicable sites (listed above) are those PA#1, PA#2, and/or 7 RFA facilities which have been identified in areas with courses available. The training contact for the courses is as follows:

James H. Hughes  
HDSSC-LOSC Training  
(407) 853-7575

**APPENDIX C.2**  
**ACTIVE SITE SAFETY INFORMATION**

## **APPENDIX C.2**

### **ACTIVE SITE SAFETY INFORMATION**

Some of the areas being investigated are active launch and support facilities where rocket fuels are stored. While these fuels may not be chemicals of concern for sampling exposure, explosive and release safety and health hazards are posed by the on-site storage. The following pages include KSC Form 28-210 (Rev. 11/88) which tabulates safety and health information concerning rockets fuels, and information about the Emergency Life Support Apparatus (ELSA) equipment that can be found at areas where rocket fuels are stored.

TOXIC CHEMICAL	PERMISSIBLE <sup>(2)</sup> EXPOSURE LEVEL (PEL) FOR 8 HRS (PARTS PER MILLION)	ODOR <sup>(1), (3)</sup> THRESHOLD	ODOR <sup>(1)</sup>	CLOUD VISIBILITY <sup>(1)</sup>	VAPOR <sup>(1)</sup> EXPOSURE SYMPTOMS
N <sub>2</sub> O <sub>4</sub> (NITROGEN TETROXIDE) OR NO <sub>2</sub> (NITROGEN DIOXIDE)	3 PPM	5 PPM	PUNGENT, SWEETISH	REDDISH BROWN HIGH IN CONCENTRATIONS	IRRITATION TO NOSE THROAT EYES. POSSIBLE DELAYED REACTION
AEROZINE 50	0.1 PPM	1.6 PPM	FISHY	COLORLESS	REACTION
MMH (MONOMETHYL HYDRAZINE)	0.2 PPM	1.3 PPM	AMMONIA	COLORLESS	COUGHING, DIFFICULTY IN BREATHING
UDMH (UNSYMMETRICAL DIMETHYL HYDRAZINE)	0.5 PPM	1.6 PPM	FISHY	COLORLESS	COUGHING, DIFFICULTY IN BREATHING
N <sub>2</sub> H <sub>4</sub> (HYDRAZINE)	0.1 PPM	3.6 PPM	AMMONIA	COLORLESS	COUGHING, DIFFICULTY IN BREATHING
NH <sub>3</sub> (ANHYDROUS AMMONIA)	25 PPM	5.20 PPM	AMMONIA LIKE PUNGENT	COLORLESS	IRRITATION OF EYES, NOSE, THROAT

#### NOTES

- (1) DATA FROM AIR FORCE MANUAL 161-30, 10 APRIL 1973
- (2) 1981 ACGIH VALUES, SUBJECT TO CHANGE YEARLY
- (3) VARIABLE BY INDIVIDUAL

### TOXIC RELEASE EMERGENCY ACTIONS (At sound of warning signal)

1. Determine wind direction and relative position of propellant spill.
2. Obtain emergency respirator from green and white box and put it on.
3. Generally, move across wind or up wind away from vapor cloud.
4. Proceed to designated evacuation area.
5. If exposed, shower for 15 minutes and report to Occupational Health.

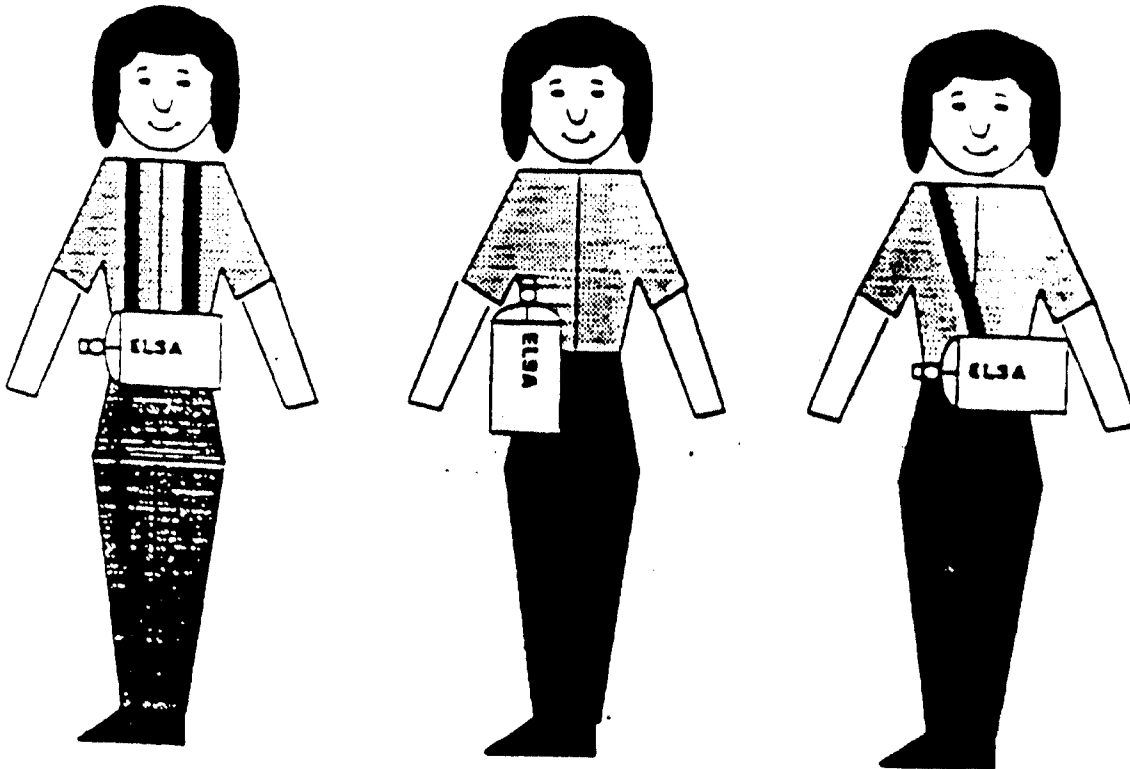
## **EMERGENCY LIFE SUPPORT APPARATUS (ELSA)**

### **SHOULD BE USED:**

- **To evacuate from a contaminated atmosphere**
- **To evacuate from/through oxygen deficient atmosphere**
- **When possibility of contaminated atmosphere exists**
- **When suspicion of contaminants exist**
  - **Sight**
  - **Smell**

## DONNING AND OPERATING INSTRUCTION

- A. Check cylinder contents – gauge should read FULL.
- B. Check that air hood is securely attached to supply tube.
- C. Check that supply hose is securely attached to cylinder.



## EMERGENCY PROCEDURES

If the hose on the ELSA were to break, come loose, or get torn while in use, place the hose connected to the cylinder under the hood or in your mouth, breath normally and get to a safe area.

Instructions on the method of operating ELSA are printed on the apparatus, sequence of operation shown below.

1.



Lift flap, remove hood,  
turn on ON/OFF valve.

2.



Pull hood over head, make  
For safety.

**APPENDIX D**  
**VENOMOUS FLORIDA SPIDERS AND SNAKES**





Figure D.1. Black Widow Spider



Figure D.2. Brown Recluse Spider





Figure D.3. Coral Snake



Figure D.4. Cottonmouth Moccasin Snake





Figure D.5 Diamondback Rattle Snake



Figure D.6 Pigmy Rattle Snake



**APPENDIX E**  
**DIRECTIONS TO MEDICAL EMERGENCY FACILITIES AND**  
**SITES**

## **APPENDIX E DIRECTIONS TO EMERGENCY MEDICAL FACILITIES AND SITES**

The following pages describes hospital locations for medical emergencies at Cape, Patrick and Malabar. Appendix E.1 provides the location of each major medical facility. Appendix E.2 provides reference site locations and evacuation routes.

### **FOR MAJOR MEDICAL EMERGENCIES:**

#### **At CCAS:**

##### **Go to Cape Canaveral Hospital**

- South on Highway 401 (Cape Road) to Highway A1A
- Highway A1A South to Highway 520
- West on Highway 520 (turn right towards mainland from CCAS)
- Go 3/4 mile
- Hospital is on right

### **FOR MINOR MEDICAL CARE:**

#### **At CCAS:**

##### **Cape Dispensary (Facility 49635)**

- Go to Industrial Area
- located at Hangar Road and Industrial Road intersection
- Dispensary is on left corner (white building) Facility 49635

**APPENDIX E.1**  
**MEDICAL FACILITIES LOCATIONS**

## **APPENDIX E.1 MEDICAL FACILITIES LOCATIONS**

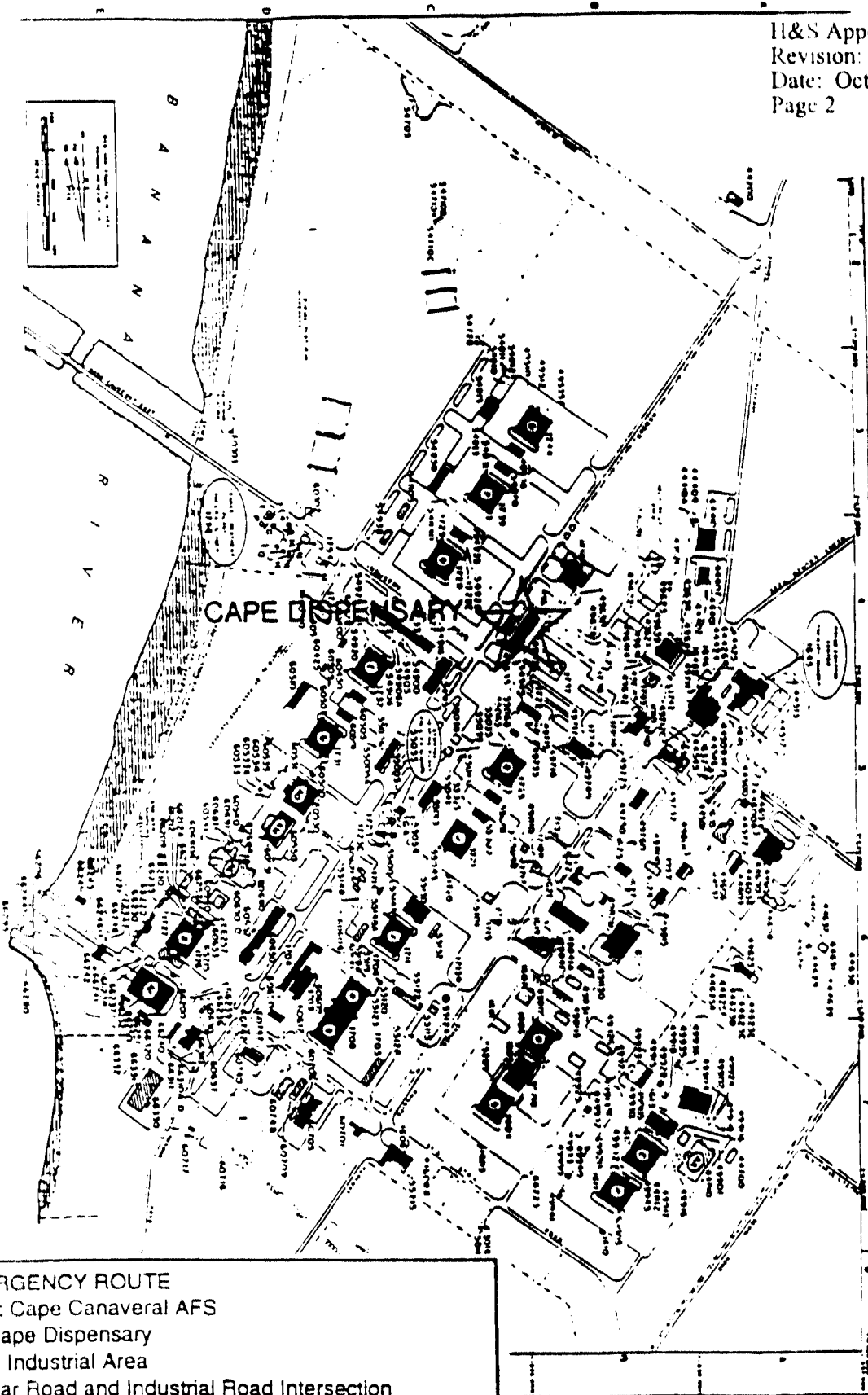
The following medical facility location maps are enclosed:

- Location of Cape Dispensary (minor care)
- Route to Cape Canaveral Hospital from Cape (major medical emergency or after hours)

Site locations are provided in Appendix E.2.

# LOCATION OF CAPE DISPENSARY FACILITY 49635

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Revision: 1  
Date: October 1999  
Page 2



## EMERGENCY ROUTE

From: Cape Canaveral AFS

To: Cape Dispensary

Go to Industrial Area

Hangar Road and Industrial Road Intersection

Dispensary on left corner (white building) Facility 49635

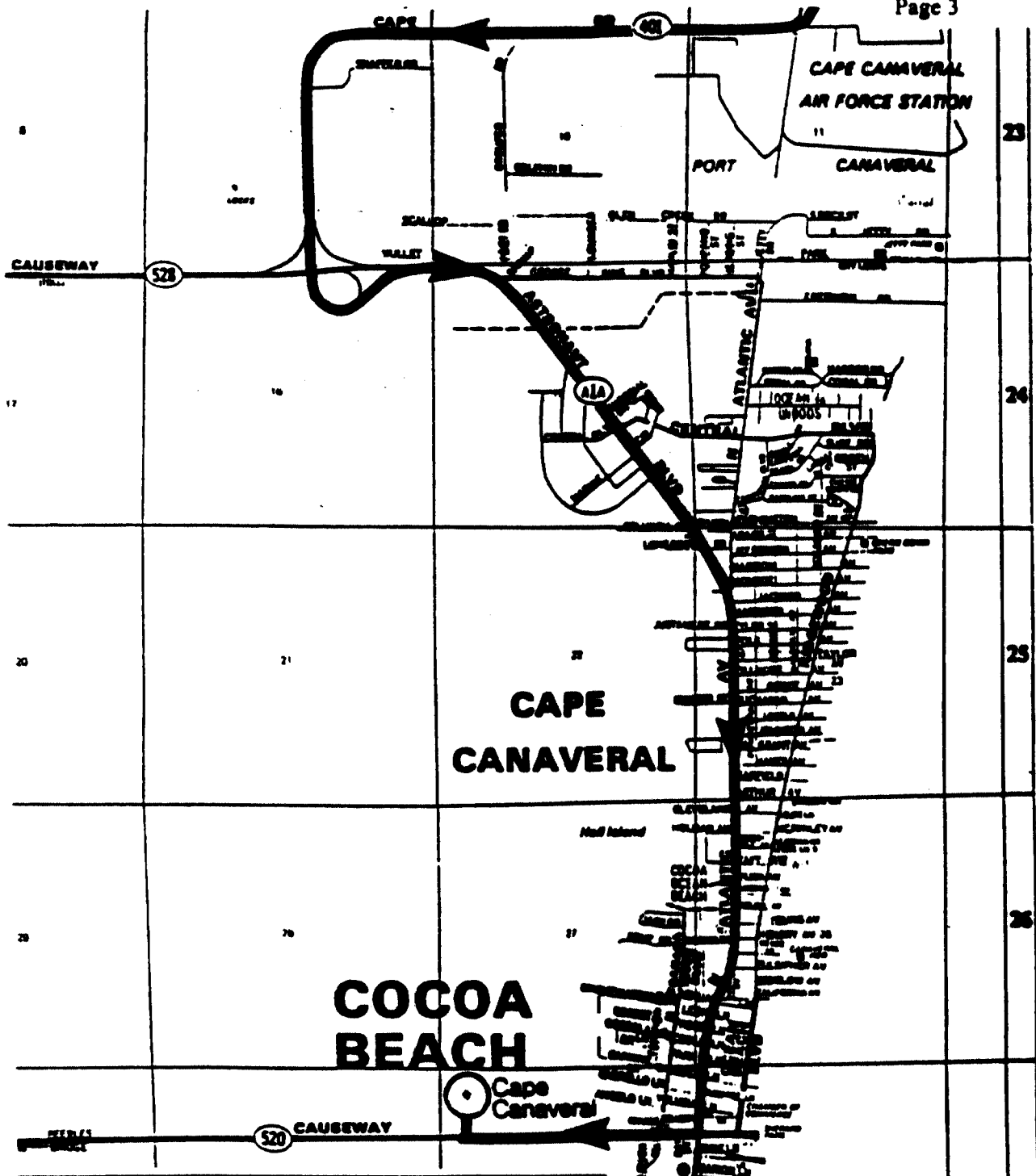
Hours of Operation: 0730 - 1600 M-F

Phone # (407) 853-2223



# ROUTE TO CAPE CANAVERAL HOSPITAL FROM CAPE CANAVERAL AFS

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Page 3



## EMERGENCY ROUTE

From: Cape Canaveral AFS

To: Cape Canaveral Hospital

South on Highway 401 (Cape Road) to Highway A1A

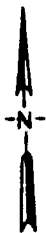
Highway A1A South to Highway 520

West on Highway 520 approx. 3/4 mile

Hospital on the right.

Hours of Operation: 24 hrs., 7 days/wk.

Phone # (407) 853-2233



**APPENDIX E.2**  
**REFERENCE SITE LOCATIONS**

## **APPENDIX E.2 REFERENCE SITE LOCATIONS**

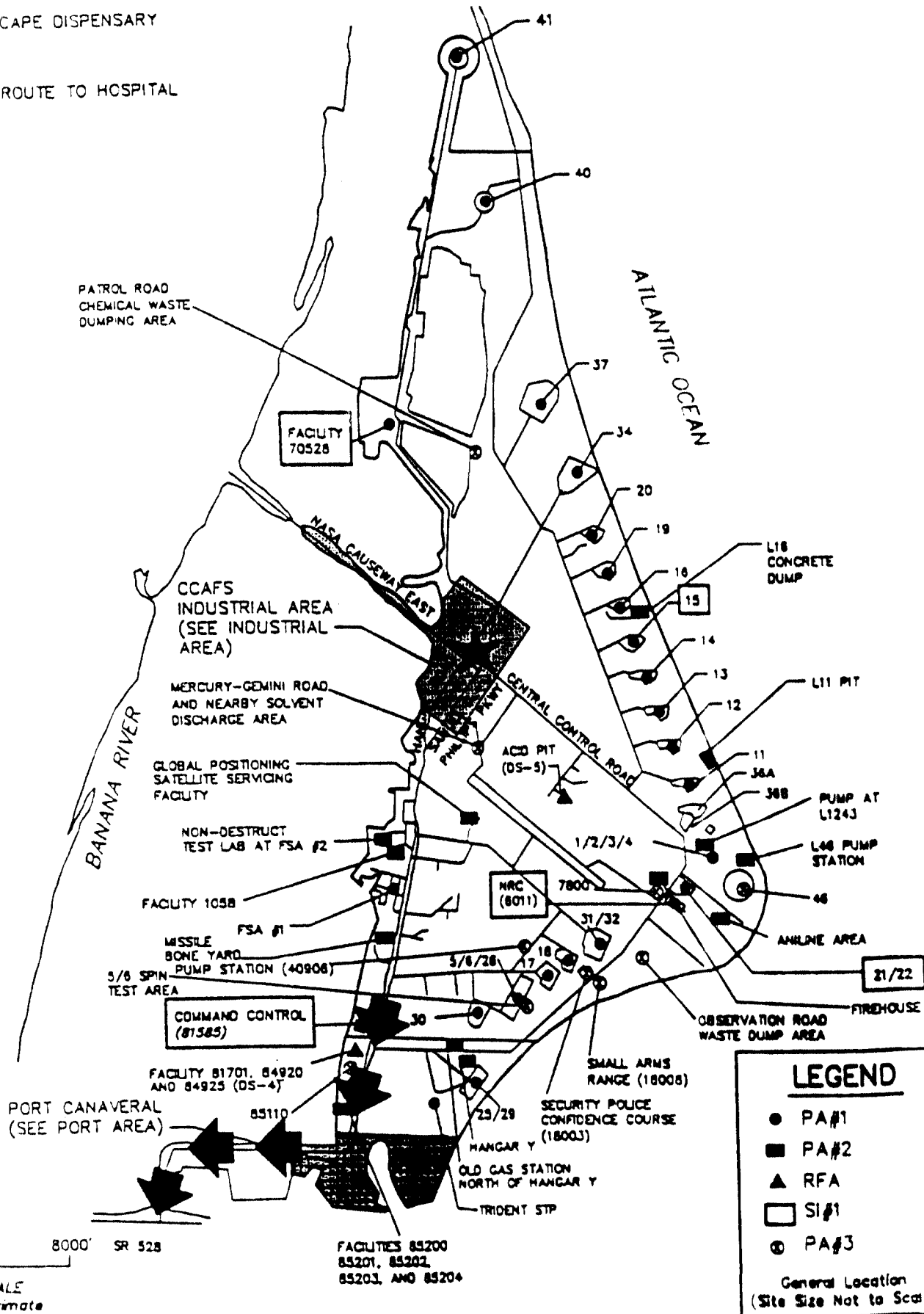
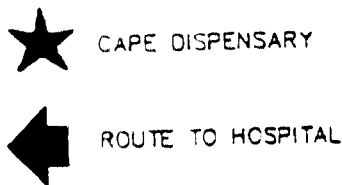
The following site location maps are enclosed:

- Cape Canaveral AS (overall)
- Cape Canaveral Industrial Area
- Cape Canaveral Port Area.

The hospital route will depend on whether major medical emergency response or minor medical care is needed. Appendix E.1 described medical facility locations.

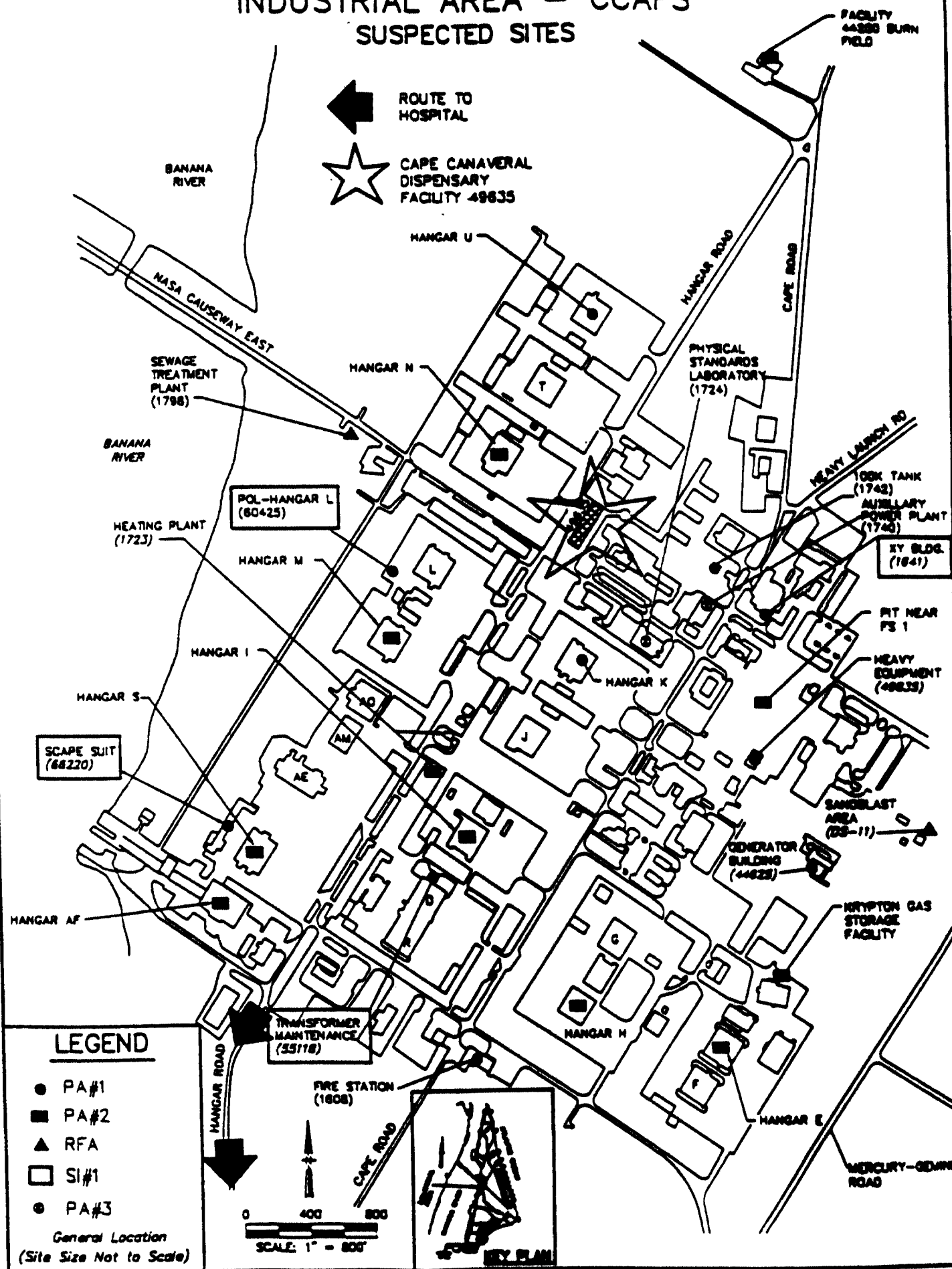
# CAPE CANAVERAL AFS SUSPECTED SITES

H&S Appendix E.2  
Revision: 1  
Date: October 1999  
Page 2



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# INDUSTRIAL AREA - CCAFS SUSPECTED SITES



**APPENDIX F**  
**MATERIAL SAFETY DATA SHEETS**

## **APPENDIX F MATERIAL SAFETY DATA SHEETS**

This appendix presents Material Safety Data Sheet (MSDS) information for the following:

- Appendix F.1 - GC Standards
- Appendix F.2 - Acids and Bases
- Appendix F.3 - Gases
- Appendix F.4 - Miscellaneous

**APPENDIX F.1**  
**MSDS - GC STANDARDS**



## **APPENDIX F.1**

### **MSDS - GC STANDARDS**

The following MSDS sheets are located at the CCAS field office:

- Benzene pg. F.1. 2-5
- Carbon Tetrachloride pg. F.1. 6-8
- 1,1-Dichloroethane pg. F.1. 9-11
- cis-1,2-Dichloroethene pg. F.1. 12-14
- trans-1,2-Dichloroethene pg. F.1. 15-17
- 1,4-Dimethylbenzene pg. F.1. 18-20
- Ethylbenzene pg. F.1. 21-23
- Fluorobenzene pg. F.1. 24-26
- Tetrachloroethylene pg. F.1. 27-29
- Toluene pg. F.1. 30-33
- 1,1,1-Trichloroethane pg. F.1. 34-37
- Trichloroethylene pg. F.1. 38-41
- Vinyl Chloride pg. F.1. 42-48
- m-Xylene pg. F.1. 49-52
- o-Xylene. pg. F.1. 53-55

CHEM SERVICE -- BENZENE, F4  
MATERIAL SAFETY DATA SHEET  
NSN: 681000N051054  
Manufacturer's CAGE: 8Y898  
Part No. Indicator: A  
Part Number/Trade Name: BENZENE, F4

=====

General Information

=====

Company's Name: CHEM SERVICE INC  
Company's P. O. Box: 3108  
Company's City: WEST CHESTER  
Company's State: PA  
Company's Country: US  
Company's Zip Code: 19381  
Company's Emerg Ph #: 215-692-3026  
Company's Info Ph #: 215-692-3026  
Record No. For Safety Entry: 001  
Tot Safety Entries This Stk#: 001  
Status: SMJ  
Date MSDS Prepared: 23JUL91  
Safety Data Review Date: 26JUL94  
MSDS Serial Number: BVNXT  
Hazard Characteristic Code: NK

=====

Ingredients/Identity Information

=====

Proprietary: NO  
Ingredient: BENZENE (SARA III)  
Ingredient Sequence Number: 01  
NIOSH (RTECS) Number: CY140000C  
CAS Number: 71-43-2  
OSHA PEL: 10 PPM (MER)  
ACGIH TLV: 10 PPM

=====

Proprietary: NO  
Ingredient: SUPDAT HAS ARRIVED. IF PATIENT IS EXHIBITING SIGNS OF SHOCK -  
KEEP WARM & QUIET. INGEST: DO NOT INDUCE VOMIT. IF (ING 3)  
Ingredient Sequence Number: 02  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

=====

Proprietary: NO  
Ingredient: ING 2: TAKEN INTERNALLY, GIVE MILK, MILK OF MAGNESIA OR EGG  
WHITES BEATEN W/WATER. DO NOT ADMIN LIQS/INDUCE VOMIT (ING 4)  
Ingredient Sequence Number: 03  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

=====

Proprietary: NO  
Ingredient: ING 3: TO UNCON/CONVULSING PERS. IF PATIENT IS VOMIT-WATCH  
CLOSELY TO MAKE SURE AIRWAY DOES NOT BECOME OBSTRUCTED (ING 5)  
Ingredient Sequence Number: 04  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

=====

Proprietary: NO  
Ingredient: ING 4: BY VOMITING. CONTACT POISON CONTROL CENTER IMMEDIATELY  
IF NECESSARY. GET MEDICAL ATTENTION IF NECESSARY.  
Ingredient Sequence Number: 05  
NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

---

Physical/Chemical Characteristics

---

Appearance And Odor: COLORLESS LIQUID; AROMATIC ODOR.  
Boiling Point: 176F,80C  
Vapor Pressure (MM Hg/70 F): 75 @ 20C  
Vapor Density (Air=1): 2.8  
Specific Gravity: 0.874  
Solubility In Water: VERY SLIGHTLY SOL

---

Fire and Explosion Hazard Data

---

Flash Point: 12F,-11C  
Lower Explosive Limit: 1.3%  
Upper Explosive Limit: 7.1%  
Extinguishing Media: CARBON DIOXIDE OR DRY CHEMICAL POWDER. DO NOT USE WATER!  
Special Fire Fighting Proc: USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).  
Unusual Fire And Expl Hazrds: NONE SPECIFIED BY MANUFACTURER.

---

Reactivity Data

---

Stability: YES  
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.  
Materials To Avoid: INCOMPATIBLE W/STRONG OXIDIZING AGENTS.  
Hazardous Decomp Products: DECOMPOSITION LIBERATES TOXIC FUMES.  
Hazardous Poly Occur: NO  
Conditions To Avoid (Poly): NOT RELEVANT

---

Health Hazard Data

---

LD50-LC50 Mixture: LD50:(ORAL,RAT) 3800 MG/KG.  
Route Of Entry - Inhalation: YES  
Route Of Entry - Skin: NO  
Route Of Entry - Ingestion: NO  
Health Haz Acute And Chronic: KNOWN CARCINOGEN - CANCER PRODUCING AGENT.  
CAN CAUSE EYE & SKIN IRRITATION. MAY BE HARMFUL IF ABSORBED THROUGH SKIN, INHALED OR SWALLOWED. CAN CAUSE BLOOD DISORDERS. CAN BE IRRITATING TO MUCOUS MEMBRANES. PROLONGED EXPOSURE MAY CAUSE NAUSEA, HEADACHE, DIZZINESS &/OR EYE DAMAGE. NARCOTIC AT HIGH (EFTS OF OVEREXP)  
Carcinogenicity - NTP: YES  
Carcinogenicity - IARC: YES  
Carcinogenicity - OSHA: YES  
Explanation Carcinogenicity: BENZENE:IARC MONOGRAPHS, SUPP, VOL 7, PG 120, 1987:GRP 1. NTP 6TH ANNUAL REPORT ON CARCINS, 1991:KNOWN TO BE (SUPP DATA)  
Signs/Symptoms Of Overexp: HLTH HAZ:CONCENTRATIONS. EXPOSURE CAN CAUSE DERMATITIS, NAUSEA, HEADACHE, DIZZINESS &/OR VOMITING. TARGET ORGANS:BLOOD, CENTRAL NERVOUS SYSTEM, SKIN, BONE MARROW, EYES & RESPIRATORY SYSTEM.  
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.  
Emergency/First Aid Proc: ANTIDOTE IS SUBSTANCE INTENDED TO COUNTERACT EFT OF POIS. IT SHOULD BE ADMIN ONLY BY MD/TRAINED EMER PERS. MED ADVICE CAN BE OBTAINED FROM POIS CTL CTR. EYES:FLUSH CONTINUOUSLY W/WATER FOR 15 LST 15-20 MINS. SKIN:FLUSH W/WATER FOR 15-20 MINS. IF NO BURNS HAVE OCCURRED-USE SOAP & WATER TO CLEANSE SKIN. REMOVE & WASH CONTAM CLTHG. INHAL:REMOVE PATIENT TO FRESH AIR. ADMIN OXYGEN IF PATIENT IS(SUPDAT)

---

Precautions for Safe Handling and Use

---

Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROPRIATE OSHA

---

REGULATED EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE OR SIMILAR MATERIAL. SWEEP UP & PLACE IN APPROPRIATE CONTAINER. HOLD FOR DISPOSAL. WASH CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.  
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.  
Waste Disposal Method: DISPOSAL MUST BE I/A/W FEDERAL, STATE & LOCAL REGULATIONS (FP N). BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AFTERBURNER & SCRUBBER.  
Precautions-Handling/Storing: AVOID CONTACT W/SKIN, EYES & CLOTHING. KEEP TIGHTLY CLOSED IN A COOL, DRY PLACE. STORE ONLY W/COMPATIBLE CHEMICALS.  
Other Precautions: THIS PRODUCT IS FURNISHED FOR LABORATORY USE ONLY! PRODUCT MAY NOT BE USED AS DRUGS, COSMETICS, AGRICULTURAL OR PESTICIDAL PRODUCTS, FOOD ADDITIVES OR AS HOUSEHOLD CHEMICALS. ALL CHEMS SHOULD BE CONSIDERED HAZ - AVOID DIRECT PHYSICAL CONT!

---

#### Control Measures

Respiratory Protection: NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N).  
Ventilation: THIS CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD  
Protective Gloves: IMPERVIOUS GLOVES (FP N).  
Eye Protection: ANSI APPROVED CHEM WORKERS GOGGS (FP N).  
Other Protective Equipment: USE APPROPRIATE OSHA/MSHA APPROVED SAFETY EQUIPMENT.  
Work Hygienic Practices: CONTACT LENSES SHOULD NOT BE WORN IN LABORATORY  
Suppl. Safety & Health Data: EXPLAN OF CARCIN: CARCIN. FED REGISTER, VOL. 52, PG 34460, 1987; OSHA-CANCER HAZ. HUMAN: MYELOID LEUKEMIA, HODGKINS DISEASE, LYMPHOMA. FIRST AID PROC: HAVING DECLTY BRTHG. IF PATIENT HAS STOPPED BRTHG ADMIN ARTF RESP. IF PATIENT IS IN CARDIAC ARREST ADMIN CPR. CONTINUE LIFE SUPPORTING MEASURES UNTIL MED ASSISTANCE (ING 2)

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#### Transportation Data

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#### Disposal Data

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#### Label Data

Label Required: YES  
Technical Review Date: 26JUL94  
Label Date: 02MAY94  
Label Status: C  
Common Name: BENZENE, F4  
Chronic Hazard: YES  
Signal Word: DANGER!  
Acute Health Hazard-Moderate: X  
Contact Hazard-Moderate: X  
Fire Hazard-Severe: X  
Reactivity Hazard-None: X  
Special Hazard Precautions: EXTREMELY FLAMMABLE. ACUTE: CAN CAUSE EYE & SKIN IRRITATION. MAY BE HARMFUL IF ABSORBED THROUGH SKIN, INHALED OR SWALLOWED. CAN CAUSE BLOOD DISORDERS. CAN BE IRRITATING TO MUCOUS MEMBRANES. PROLONGED EXPOSURE MAY CAUSE NAUSEA, HEADACHE, DIZZINESS &/OR EYE DAMAGE. MAY CAUSE DERMATITIS, NAUSEA, HEADACHE, DIZZINESS, VOMITING. CHRONIC: CANCER HAZARD. CONTAINS BENZENE, WHICH IS LISTED AS A BLOOD CARCINOGEN TO HUMANS (FP N). TARGET ORGANS: BLOOD, CENTRAL NERVOUS SYSTEM, SKIN, BONE MARROW, EYES & RESPIRATORY SYSTEM.  
Protect Eye: Y  
Protect Skin: Y  
Protect Respiratory: Y  
Label Name: CHEM SERVICE INC  
Label P.O. Box: 3108  
Label City: WEST CHESTER  
Label State: PA

Label Zip Code: 19381  
Label Country: US  
Label Emergency Number: 215-692-3026

---

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FISHER SCIENTIFIC CHEMICAL DIV -- CARBON TETRACHLORIDE  
MATERIAL SAFETY DATA SHEET  
NSN: 681000F021927  
Manufacturer's CAGE: 1B464  
Part No. Indicator: A  
Part Number/Trade Name: CARBON TETRACHLORIDE

General Information

Company's Name: FISHER SCIENTIFIC CHEMICAL DIVISION  
Company's Street: 1 REAGENT LANE  
Company's City: FAIR LAWN  
Company's State: NJ  
Company's Zip Code: 07410  
Company's Emerg Ph #: (201) 796-7100  
Company's Info Ph #: (201) 796-7100  
Record No. For Safety Entry: 001  
Tot Safety Entries This Stk#: 001  
Date MSDS Prepared: 13OCT89  
Safety Data Review Date: 02MAR92  
Preparer's Company: FISHER SCIENTIFIC CHEMICAL DIVISION  
Preparer's St Or P. O. Box: 1 REAGENT LANE  
Preparer's City: FAIR LAWN  
Preparer's State: NJ  
Preparer's Zip Code: 07410  
MSDS Serial Number: BMMXH

Ingredients/Identity Information

Proprietary: NO  
Ingredient: CARBON TETRACHLORIDE  
Ingredient Sequence Number: 01  
Percent: 100%  
NIOSH (RELCS) Number: FG4900000  
CAS Number: 56-23-5  
OSHA PEL: 10 PPM  
ACGIH TLV: 5.5PPM/10 STEL, A2 93  
Other Recommended Limit: 5 PPM

Physical/Chemical Characteristics

Appearance And Odor: COLORLESS LIQUID W/AN ETHEREAL ODOR.  
Boiling Point: 172F  
Melting Point: -9F  
Vapor Pressure (MM Hg/70 F): 91.3  
Vapor Density (Air=1): 5.3  
Specific Gravity: 1.58  
Evaporation Rate And Ref: (BU AC = 1): 12.8  
Solubility In Water: 0.08%

Fire and Explosion Hazard Data

Extinguishing Media: DRY CHEMICAL, CO2, HALON, WATER SPRAY OR STANDARD  
FOAM. USE SUITBLE AGENT FOR SURROUNDING FIRE.  
Special Fire Fighting Proc: MOVE CONTAINERS FROM FIRE AREA IF POSSIBLE.  
FIGHT FIRE FROM MAXIMUM DISTANCE. STAY AWAY FROM STORAGE TANK ENDS. DIKE  
FIRE CONTROL. WATER FOR LATER DISPOSAL.  
Unusual Fire And Expl Hazrds: WHEN INVOLVED IN FIRE, CARBON TETRACHLORIDE  
EMITS HIGHLY TOXIC & IRRITATING FUMES. MAY BURN BUT DOESN'T IGNITE READILY.  
CONTAINERS MAY EXPLODE IN HEAT OR FIRE.

Reactivity Data

---

Stability: YES  
Cond To Avoid (Stability): HEAT OR FLAME. UNDER NORMAL TEMPERATURES & PRESSURES.  
Materials To Avoid: REACTS WITH NUMEROUS MATERIALS.  
Hazardous Decomp Products: TOXIC, CORROSIVE FUMES OF CHLORIDES, PHOSGENE, TOXIC OXIDES OF CARBON.  
Hazardous Poly Occur: NO

---

#### Health Hazard Data

---

Route Of Entry - Inhalation: YES  
Route Of Entry - Skin: YES  
Route Of Entry - Ingestion: YES  
Health Haz Acute And Chronic: INHALATION: NAUSEA, VOMITING, ABDOMINAL PAIN & DIARRHEA. SKIN: IRRITATION, DERMATITIS DUE TO THE DEFATTING. EYES: LIQUID OR VAPOR MAY CAUSE TRANSIENT IRRITATION & MINOR CONJUNCTIVAL INJURY. INGESTION: NARCOTIC, NEPHROTOXIC, HEPATOTOXIN, CARCINOGEN.  
Carcinogenicity - NTP: NO  
Carcinogenicity - IARC: NO  
Carcinogenicity - OSHA: NO  
Explanation Carcinogenicity: CARBON TETRACHLORIDE IS A CONSIDERED TO BE AN A2 CARCINOGEN BY ACGIH.  
Signs/Symptoms Of Overexp: INHALATION: DIZZINESS, HEADACHE, MENTAL CONFUSION, RESPIRATORY DEPRESSION, HYPOTENSION, COMA, CONVULSIONS, DEATH. SKIN: IRRITATION, DERMATITIS DUE TO THE DEFATTING. EYES: LIQUID OR VAPOR, TRANSIENT IRRITATION & MINOR CONJUNCTIVAL INJURY. INGESTION: NARCOTIC, NEPHROTOXIC, HEPATOTOXIN, CARCINOGEN.  
Emergency/First Aid Proc: SKIN: WASH AFFECTED AREA W/ SOAP OR MILD DETERGENT & LARGE AMOUNTS OF WATER THAN 15-20 MINS. EYES: WASH W/ LARGE AMOUNTS OF WATER OR NORMAL SALINE THAN 15-20 MINS. INGESTION: REMOVE BY GASTRIC LAVAGE OR EMESIS. MAINTAIN BLOOD PRESSURE & AIRWAY. DON'T PERFORM GASTRIC LAVAGE OR EMESIS IF VICTIM IS UNCONSCIOUS. DON'T GIVE STIMULANTS WHICH MAY INDUCE VENTRICULAR FIBRILLATION. OBTAIN MED ATT IN ALL CASES

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#### Precautions for Safe Handling and Use

---

Steps If Matl Released/Spill: DON'T TOUCH SPILLED MATERIAL. STOP LEAK IF YOU CAN DO IT W/OUT RISK. USE WATER SPRAY TO REDUCE VAPORS. FOR SMALL SPILLS, TAKE UP W/ SAND OR OTHER ABSORBENT MATERIAL/ PLACE INTO THE CONTAINERS FOR LARGE DISPOSAL. MOVE CONTAINERS FROM SPILL AREA.  
Waste Disposal Method: REPORTABLE QUANTITY: 5000 PDS.  
Precautions-Handling/Storing: PROTECT AGAINST PHYSICAL DAMAGE. STORE IN A COOL, DRY WELL VENTILATED LOCATION, AWAY FROM ANY AREA WHERE THE FIRE HAZARD MAY BE HAZARDOUS.

---

#### Control Measures

---

Respiratory Protection: SELF-CONTAINED BREATHING APPARATUS W/ FULL FACEPIECE OPERATED IN PRESSURE DEMAND OR OTHER POSITIVE PRESSURE MODE.  
Ventilation: PROCESS ENCLOSURE RECOMMENDED TO MEET TLV.  
Protective Gloves: PROTECTIVE  
Eye Protection: SPLASH-PROOF, SAFETY GOGGLES, FACESHIELD  
Other Protective Equipment: EYE WASH & QUICK DRENCH SHOWER  
Work Hygienic Practices: REMOVE/WASH CONTAMINATED CLOTHING BEFORE REUSE.

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#### Transportation Data

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#### Disposal Data

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Label Data

Label Required: YES

Label Status: G

Common Name: CARBON TETRACHLORIDE

Special Hazard Precautions: INHALATION: NAUSEA, VOMITING, ABDOMINAL PAIN & DIARRHEA. SKIN: IRRITATION, DERMATITIS DUE TO THE DEFATTING. EYES: LIQUID OR VAPOR MAY CAUSE TRANSIENT IRRITATION & MINOR CONJUNCTIVAL INJURY. DIZZINESS, HEADACHE, MENTAL CONFUSION, RESPIRATORY DEPRESSION, HYPOTENSION, COMA, CONVULSIONS, DEATH. SKIN: IRRITATION, DERMATITIS DUE TO THE DEFATTING. EYES: LIQUID OR VAPOR, TRANSIENT IRRITATION & MINOR CONJUNCTIVAL INJURY. INGESTION: NARCOTIC, NEPHROTOXIC, HEPATOTOXIN, CARCINOGEN.

Label Name: FISHER SCIENTIFIC CHEMICAL DIVISION

Label Street: 1 REAGENT LANE

Label City: FAIR LAWN

Label State: NJ

Label Zip Code: 07410

Label Emergency Number: 201) 796-7100

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CHEM SERVICE -- F13 1,1-DICHLOROETHANE  
MATERIAL SAFETY DATA SHEET  
NSN: 655000F037545  
Manufacturer's CAGE: 8Y898  
Part No. Indicator: A  
Part Number/Trade Name: F13 1,1-DICHLOROETHANE

---

General Information

---

Company's Name: CHEM SERVICE INC  
Company's Street: 660 TOWER LN  
Company's P. O. Box: 3108  
Company's City: WEST CHESTER  
Company's State: PA  
Company's Country: US  
Company's Zip Code: 19381-3108  
Company's Emerg Ph #: 215-692-3026/800-452-9994  
Company's Info Ph #: 215-692-3026/800-452-9994  
Record No. For Safety Entry: 001  
Tot Safety Entries This Stk#: 001  
Status: SE  
Date MSDS Prepared: 01JUN89  
Safety Data Review Date: 30DEC94  
Preparer's Company: CHEM SERVICE INC  
Preparer's St Or P. O. Box: 660 TOWER LN  
Preparer's City: WEST CHESTER  
Preparer's State: PA  
Preparer's Zip Code: 19381-3108  
MSDS Serial Number: BWJHT

---

Ingredients/Identity Information

---

Proprietary: NO  
Ingredient: 1,1-DICHLOROETHANE (ETHYLIDINE CHLORIDE)  
Ingredient Sequence Number: 01  
NIOSH (RTECS) Number: KI0175000  
CAS Number: 75-34-3  
OSHA PEL: 100 PPM  
ACGIH TLV: 200 PPM  
Other Recommended Limit: 200 PPM

---

Physical/Chemical Characteristics

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Appearance And Odor: COLORLESS LIQUID W/FRUITY/PLEASANT ODOR.  
Boiling Point: 135.14F  
Melting Point: -142.6F  
Vapor Pressure (MM Hg/70 F): 182  
Vapor Density (Air=1): 3.4  
Solubility In Water: SLIGHT

---

Fire and Explosion Hazard Data

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Flash Point: 23F  
Lower Explosive Limit: 6  
Upper Explosive Limit: 16  
Extinguishing Media: CO2, DRY CHEMICAL POWDER. DONT USE WATER.  
Unusual Fire And Expl Hazrds: FLAMMABLE CHEMICAL.

---

Reactivity Data

---

Stability: YES  
Cond To Avoid (Stability): SENSITIVE TO HEAT.  
Materials To Avoid: STRONG OXIDIZING AGENTS/BASES, CAUSTICS.  
Hazardous Decomp Products: TOXIC FUMES.

---

Hazardous Poly Occur: NO

Health Hazard Data

LD50-LC50 Mixture: ORAL LD50 (RAT/MOUSE): 725 MG/KG

Route Of Entry - Inhalation: YES

Route Of Entry - Skin: YES

Route Of Entry - Ingestion: YES

Health Haz Acute And Chronic: SKIN: RAPIDLY ABSORBED/HARMFUL/IRRITATION/  
ALLERGIC REACTION/SENSITIZATION. INHALATION: HARMFUL/RESPIRATORY TRACT  
IRRITATION. EXPOSURE CAN CAUSE LIVER/KIDNEY/NERVOUS SYSTEM INJURY, DELAYED  
ADVERSE HEALTH EFFECTS. NARCOTIC AT HIGH CONCENTRATIONS.

Carcinogenicity - NTP: NO

Carcinogenicity - IARC: NO

Carcinogenicity - OSHA: NO

Explanation Carcinogenicity: NONE

Signs/Symptoms Of Overexp: IRRITATION, DISORIENTATION.

Emergency/First Aid Proc: EYES: FLUSH W/WATER FOR 15-20 MINS. SKIN: FLUSH  
REMOVE TO FRESH AIR. GIVE CPR/OXYGEN IF NEEDED. KEEP WARM & QUIET.

INGESTION: DON'T INDUCE VOMITING/GIVE LIQUIDS IF UNCONSCIOUS/ CONVULSIVE.  
IF VOMITING, WATCH CLOSELY FOR ANY AIRWAY OBSTRUCTION. OBTAIN MEDICAL  
ATTENTION IN ALL CASES.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROPRIATE OSHA  
REGULATED EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE/SIMILAR  
MATERIAL. SWEEP UP & PLACE IN APPROPRIATE CONTAINER/HOLD FOR DISPOSAL. WASH  
CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.

Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN  
AFTERBURNER & SCRUBBER IAW/FEDERAL, STATE & LOCAL REGULATIONS.

Precautions-Handling/Storing: KEEP TIGHTLY CLOSED IN A COOL DRY PLACE.

STORE ONLY W/COMPATIBLE CHEMICALS. FOR LABORATORY USE ONLY.

Other Precautions: AVOID CONTACT W/SKIN, EYES & CLOTHING. DON'T BREATHE  
VAPORS. CONTACT LENSES SHOULDN'T BE WORN IN THE LABORATORY. ALL CHEMICALS  
SHOULD BE CONSIDERED HAZARDOUS. AVOID DIRECT PHYSICAL CONTACT.

Control Measures

Respiratory Protection: WEAR APPROPRIATE OSHA/MSHA APPROVED SAFETY  
EQUIPMENT

Ventilation: CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD

Eye Protection: EYE SHIELDS

Work Hygienic Practices: REMOVE/LAUNDER CONTAMINATED CLOTHING BEFORE  
REFUSE. READILY ABSORBED & RETAINED ON CLOTHING & SHOES.

Transportation Data

Disposal Data

Label Data

Label Required: YES

Label Status: G

Common Name: F13 1,1-DICHLOROETHANE

Special Hazard Precautions: SKIN: RAPIDLY ABSORBED/HARMFUL/IRRITATION/  
ALLERGIC REACTION/SENSITIZATION. INHALATION: HARMFUL/RESPIRATORY TRACT  
IRRITATION. EXPOSURE CAN CAUSE LIVER/KIDNEY/NERVOUS SYSTEM INJURY, DELAYED  
ADVERSE HEALTH EFFECTS. NARCOTIC AT HIGH CONCENTRATIONS. IRRITATION,  
DISORIENTATION

Label Name: CHEM SERVICE INC

Label Street: 660 DOWEN LN

Label P.O. Box: 3108  
Label City: WEST CHESTER  
Label State: PA  
Label Zip Code: 19381-3108  
Label Country: US  
Label Emergency Number: 215-692-3026/800-452-9994

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CHEM SERVICE -- 0-659 CIS 1,2-DICHLOROETHENE - LABORATORY STANDARD  
MATERIAL SAFETY DATA SHEET  
NSN: 655000F037480  
Manufacturer's CAGE: 8Y898  
Part No. Indicator: A  
Part Number/Trade Name: 0-659 CIS 1,2-DICHLOROETHENE

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General Information

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Item Name: LABORATORY STANDARD  
Company's Name: CHEM SERVICE INC  
Company's Street: 660 TOWER LN  
Company's P. O. Box: 3108  
Company's City: WEST CHESTER  
Company's State: PA  
Company's Country: US  
Company's Zip Code: 19381-3108  
Company's Emerg Ph #: 215-692-3026/800-452-9994  
Company's Info Ph #: 215-692-3026/800-452-9994  
Record No. For Safety Entry: 001  
Tot Safety Entries This Stk#: 001  
Status: SE  
Date MSDS Prepared: 02JUN92  
Safety Data Review Date: 06DEC94  
Preparer's Company: CHEM SERVICE INC  
Preparer's St Or P. O. Box: 660 TOWER LN  
Preparer's City: WEST CHESTER  
Preparer's State: PA  
Preparer's Zip Code: 19381-3108  
MSDS Serial Number: BWJDT

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Ingredients/Identity Information

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Proprietary: NO  
Ingredient: DICHLOROETHENE  
Ingredient Sequence Number: 01  
NIOSH (RTECS) Number: KV9420000  
CAS Number: 156-59-2

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Physical/Chemical Characteristics

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Appearance And Odor: COLORLESS LIQUID  
Boiling Point: 140F  
Melting Point: -112F  
Solubility In Water: INSOLUBLE

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Fire and Explosion Hazard Data

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Flash Point: 42.8F  
Extinguishing Media: CO2, DRY CHEMICAL POWDER/SPRAY.  
Unusual Fire And Expl Hazrds: FLAMMABLE CHEMICAL. VAPORS MAY TRAVEL  
CONSIDERABLE DISTANCE TO IGNITION SOURCE & FLASH BACK. DECOMPOSITION  
PRODUCTS ARE CORROSIVE.

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Reactivity Data

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Stability: YES  
Cond To Avoid (Stability): MOISTURE, AIR, LIGHT, HEAT & OTHER IGNITION  
SOURCES.  
Materials To Avoid: STRONG OXIDIZING AGENTS, MAGNESIUM, ALUMINUM.  
Hazardous Decomp Products: TOXIC FUMES  
Hazardous Poly Occur: NO

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Health Hazard Data

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Route Of Entry - Inhalation: YES  
Route Of Entry - Skin: YES  
Route Of Entry - Ingestion: YES  
Health Haz Acute And Chronic: SKIN: MAY BE HARMFUL IF ABSORBED. CAN CAUSE IRRITATION. INHALATION: MAY BE HARMFUL. DUST & VAPORS CAN CAUSE RESPIRATORY TRACT IRRITATION. CAN BE IRRITATING TO MUCOUS MEMBRANCES. INGESTION: MAY BE HARMFUL. EYES: IRRITATION. EXPOSURE CAN CAUSE LIVER DAMAGE. NARCOTIC AT HIGH CONCENTRATIONS.  
Carcinogenicity - NTP: NO  
Carcinogenicity - IARC: NO  
Carcinogenicity - OSHA: NO  
Explanation Carcinogenicity: NONE  
Signs/Symptoms Of Overexp: IRRITATION, NARCOTIC.  
Emergency/First Aid Proc: EYES: FLUSH CONTINUOUSLY W/WATER FOR 15-20 MINS. SKIN: FLUSH W/WATER FOR 15-20 MINS. IF NOT BURNED, WASH W/SOAP & WATER TO CLEANSE. INHALATION: REMOVE TO FRESH AIR. GIVE CPR/OXYGEN IF NEEDED & CONTINUE LIFE SUPPORT UNTIL MEDICAL ASSISTANCE ARRIVES. INGESTION: RINSE MOUTH OUT W/WATER, IF CONSCIOUS. OBTAIN MEDICAL ATTENTION IN ALL CASES.

#### Precautions for Safe Handling and Use

Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROPRIATE OSHA REGULATED EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE/SIMILAR MATERIAL. SWEEP UP & PLACE IN APPROPRIATE CONTAINER/HOLD FOR DISPOSAL. WASH CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.  
Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN AFTERBURNER & SCRUBBER IAW/FEDERAL, STATE & LOCAL REGULATIONS.  
Precautions-Handling/Storing: STORE IN A COOL DRY PLACE ONLY W/COMPATIBLE CHEMICALS. KEEP TIGHTLY CLOSED. STORE UNDER REFRIGERATION.  
Other Precautions: AVOID CONTACT W/SKIN, EYES & CLOTHING. DON'T BREATHE VAPORS. CONTACT LENSES SHOULDN'T BE WORN IN THE LABORATORY. ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS. AVOID DIRECT PHYSICAL CONTACT.

#### Control Measures

Respiratory Protection: WEAR APPROPRIATE OSHA/MSHA APPROVED SAFETY EQUIPMENT.  
Ventilation: CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.  
Eye Protection: EYE SHIELDS

#### Transportation Data

#### Disposal Data

#### Label Data

Label Required: YES  
Label Status: G  
Common Name: 0-659 CIS 1,2-DICHLOROETHENE  
Special Hazard Precautions: SKIN: MAY BE HARMFUL IF ABSORBED. CAN CAUSE IRRITATION. INHALATION: MAY BE HARMFUL. DUST & VAPORS CAN CAUSE RESPIRATORY TRACT IRRITATION. CAN BE IRRITATING TO MUCOUS MEMBRANCES. INGESTION: MAY BE HARMFUL. EYES: IRRITATION. EXPOSURE CAN CAUSE LIVER DAMAGE. NARCOTIC AT HIGH CONCENTRATIONS. IRRITATION, NARCOTIC.  
Label Name: CHEM SERVICE INC  
Label Street: 660 TOWER LN  
Label P.O. Box: 3108  
Label City: WEST CHESTER  
Label State: PA  
Label Zip Code: 19381-3108  
Label Country: US

Label Emergency Number: 215-692-3026/800-452-9994

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CHEM SERVICE -- TRANS-1,2-DICHLOROETHENE, O-660  
MATERIAL SAFETY DATA SHEET  
NSN: 681000N067797  
Manufacturer's CAGE: 8Y898  
Part No. Indicator: A  
Part Number/Trade Name: TRANS-1,2-DICHLOROETHENE, O-660

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General Information

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Company's Name: CHEM SERVICE INC  
Company's P. O. Box: 3108  
Company's City: WEST CHESTER  
Company's State: PA  
Company's Country: US  
Company's Zip Code: 19381  
Company's Emerg Ph #: 215-692-3026  
Company's Info Ph #: 215-692-3026  
Safety Data Action Code: C  
Record No. For Safety Entry: 001  
Tot Safety Entries This Stk#: 001  
Status: SMJ  
Date MSDS Prepared: 01SEP88  
Safety Data Review Date: 27DEC95  
MSDS Serial Number: CBGMP

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Ingredients/Identity Information

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Proprietary: NO  
Ingredient: ETHYLENE, 1,2-DICHLORO-, (E)-; (TRANS-1,2-DICHLOROETHYLENE)  
(SARA 313) (CERCLA)  
Ingredient Sequence Number: 01  
NIOSH (RTECS) Number: KV9400000  
CAS Number: 156-60-5  
OSHA PEL: 200 PPM (MFR)  
ACGIH TLV: 200 PPM (MFR)

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Physical/Chemical Characteristics

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Appearance And Odor: COLORLESS LIQUID  
Boiling Point: 118F, 48C  
Melting Point: -58F, -50C  
Specific Gravity: 1.257  
Solubility In Water: INSOLUBLE

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Fire and Explosion Hazard Data

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Flash Point: 42.8F, 6.0C  
Extinguishing Media: USE CARBON DIOXIDE, DRY CHEMICAL POWDER OR WATER  
SPRAY.  
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED SCBA & FULL  
PROTECTIVE EQUIPMENT (FP N).  
Unusual Fire And Expl Hazrds: NONE SPECIFIED BY MANUFACTURER.

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Reactivity Data

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Stability: YES  
Cond To Avoid (Stability): FLAMMABLE.  
Materials To Avoid: INCOMPATIBLE WITH STRONG OXIDIZING AGENTS, STRONG  
BASES. REACTS WITH WATER AND MOST REACTIVE HYDROGEN COMPOUNDS.  
Hazardous Decomp Products: DECOMPOSITION LIBERATES TOXIC FUMES.  
DECOMPOSITION PRODUCTS ARE CORROSIVE. \*  
Hazardous Poly Occur: NO \*  
Conditions To Avoid (Poly): NOT RELEVANT. \*

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Health Hazard Data

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LD50-LC50 Mixture: LD50 (ORAL RAT): 7536 MG/KG. \*

Route Of Entry - Inhalation: YES \*

Route Of Entry - Skin: YES \*

Route Of Entry - Ingestion: YES \*

Health Haz Acute And Chronic: ACUTE: CAN BE HARMFUL IF ABSORBED THRU SKIN, INHALED/SWALLOWED. CAN CAUSE SKIN AND EYE IRRITATION. CAN BE IRRITATING TO MUCOUS MEMBRANES. VAPORS AND/OR DIRECT EYE CONTACT CAN CAUSE SEVERE EYE BURNS. CHRONIC: PROLONGED EXPOSURE MAY CAUSE NAUSEA, HEADACHE, DIZZINESS AND/OR EYE DAMAGE. CAN CAUSE LIVER & KIDNEY INJURY. \*

Carcinogenicity - NTP: NO \*

Carcinogenicity - IARC: NO \*

Carcinogenicity - OSHA: NO \*

Explanation Carcinogenicity: NOT RELEVANT. \*

Signs/Symptoms Of Overexp: SEE HEALTH HAZARDS. \*

Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER. \*

Emergency/First Aid Proc: AN ANTIDOTE IS A SUBSTANCE INTENDED TO COUNTERACT EFT OF POIS. IT SHOULD BE ADMIN ONLY BY MD/TRAINED EMER PERS. MED ADVICE CAN BE OBTAINED FROM POIS CTL CTR. EYES: FLUSH CONTINUOUSLY W/ WATER FOR AT LEAST 15 MIN. SKIN: FLUSH W/WATER FOR 15-20 MIN. IF NO BURNS HAVE OCCURRED, USE SOAP & WATER TO CLEANSE SKIN. INHAL: REMOVE TO FRESH AIR. ADMIN OXYGEN IF DFCLT BRTHG. IF BRTHG HAS STOPPED, (SUP DAT) \*

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Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROPRIATE OSHA-REGULATED EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE OR SIMILAR MATERIAL. SWEEP UP AND PLACE IN AN APPROPRIATE CONTAINER. HOLD FOR DISPOSAL. WASH CONTAMINATED SURFACES TO REMOVE ANY RESIDUES. \*

Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER. \*

Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER. DISPOSE OF IN ACCORDANCE W/LOCAL, STATE & FEDERAL REGULATIONS (FP N). \*

Precautions-Handling/Storing: ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS. AVOID DIRECT PHYSICAL CONTACT! USE APPROPRIATE OSHA/MSMA APPROVED SAFETY EQUIPMENT. \*

Other Precautions: AVOID CONT W/SKIN, EYES, & CLTHG. KEEP TIGHTLY CLSD & STORE IN COOL DRY PLACE. STORE ONLY W/COMPATIBLE CHEM. PERS NOT SPECIFICALLY & PROPERLY TRAINED SHOULD NOT HANDLE THIS CHEM/ITS CONTR. THIS PROD IS FURNISHED FOR LAB USE ONLY! (SUP DAT) \*

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Control Measures

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Respiratory Protection: USE NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N). \*

Ventilation: THIS CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD. \*

Protective Gloves: IMPERVIOUS GLOVES (FP N). \*

Eye Protection: ANSI APPRVD CHEM WORKERS GOGGOS (FP N). \*

Other Protective Equipment: EMERGENCY EYEWASH & DELUGE SHOWER MEETING ANSI DESIGN CRITERIA (FP N). \*

Work Hygienic Practices: CONTACT LENSES SHOULD NOT BE WORN IN THE LABORATORY. \*

Suppl. Safety & Health Data: FIRST AID PROC: ADMIN ARTF RESP. IF PATIENT IN CARD ARREST, ADMIN CPR. CONTINUE LIFE SUPPORTING MEASURES UNTIL MED ASSIST HAS ARRIVED. INGEST: CALL MD IMMED (FP N). OTHER PREC: THIS PROD MAY NOT BE USED AS DRUGS, COSMETICS, AGRICULTURAL/PESTICIDAL PRODS, FOOD ADDITIVES/AS HOUSEHOLD CHEMICALS. \*

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Transportation Data

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Disposal Data

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Label Data

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Label Required: YES  
Technical Review Date: 27DEC95  
Label Date: 27DEC95  
Label Status: B  
Common Name: TRANS-1,2-DICHLOROETHENE, O-660  
Chronic Hazard: YES  
Signal Word: DANGER!  
Acute Health Hazard-Moderate: X  
Contact Hazard-Slight: X  
Fire Hazard-Severe: X  
Reactivity Hazard-Slight: X  
CAN BE HARMFUL IF ABSORBED THRU SKIN, INHALED/SWALLOWED. CAN CAUSE SKIN AND EYE IRRITATION. CAN BE IRRITATING TO MUCOUS MEMBRANES. VAPORS AND/OR DIRECT EYE CONTACT CAN CAUSE SEVERE EYE BURNS. CHRONIC: PROLONGED EXPOSURE MAY CAUSE NAUSEA, HEADACHE, DIZZINESS AND/OR EYE DAMAGE. CAN CAUSE LIVER AND KIDNEY INJURY.  
Protect Eye: X  
Protect Skin: X  
Protect Respiratory: X  
Label Name: CHEM SERVICE INC  
Label P.O. Box: 3108  
Label City: WEST CHESTER  
Label State: PA  
Label Zip Code: 19381  
Label Country: US  
Label Emergency Number: 215-692-3026

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CHEM SERVICE - O-781 1,4-DIMETHYLBENZENE  
MATERIAL SAFETY DATA SHEET  
NSN: 655000F037501  
Manufacturer's CAGE: 8Y898  
Part No. Indicator: A  
Part Number/Trade Name: O-781 1,4-DIMETHYLBENZENE

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General Information

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Company's Name: CHEM SERVICE INC  
Company's Street: 660 TOWER LN  
Company's P. O. Box: 3108  
Company's City: WEST CHESTER  
Company's State: PA  
Company's Country: US  
Company's Zip Code: 19381-3108  
Company's Emerg Ph #: 215-692-3026/800-452-9994  
Company's Info Ph #: 215-692-3026/800-452-9994  
Record No. For Safety Entry: 001  
Tot Safety Entries This Stk#: 001  
Status: SE  
Date MSDS Prepared: 17MAR92  
Safety Data Review Date: 08DEC94  
Preparer's Company: CHEM SERVICE INC  
Preparer's St Or P. O. Box: 660 TOWER LN  
Preparer's City: WEST CHESTER  
Preparer's State: PA  
Preparer's Zip Code: 19381-3108  
MSDS Serial Number: BWJFT

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Ingredients/Identity Information

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Proprietary: NO  
Ingredient: P-XYLENE  
Ingredient Sequence Number: 01  
NIOSH (RTECS) Number: ZE2625000  
CAS Number: 106-42-3  
OSHA PEL: 100 PPM  
ACGIH TLV: 100 PPM

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Physical/Chemical Characteristics

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Appearance And Odor: COLORLESS LIQUID W/AROMATIC ODOR.  
Boiling Point: 280.4F  
Melting Point: 55.4F  
Vapor Pressure (MM Hg/70 F): 9  
Solubility In Water: INSOLUBLE

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Fire and Explosion Hazard Data

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Flash Point: 80.6F  
Lower Explosive Limit: 1.1  
Upper Explosive Limit: 7  
Extinguishing Media: CO2, DRY CHEMICAL POWDER/SPRAY.  
Unusual Fire And Expl Hazrds: FLAMMABLE CHEMICAL.

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Reactivity Data

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Stability: YES  
Materials To Avoid: STRONG OXIDIZING AGENTS.  
Hazardous Decomp Products: TOXIC FUMES, DECOMPOSITION PRODUCTS ARE  
CORROSIVE.  
Hazardous Poly Occur: NO

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Health Hazard Data

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LD50-LC50 Mixture: ORAL LD50 (RAT/MOUSE): 5000 MG/KG  
Route Of Entry - Inhalation: YES  
Route Of Entry - Skin: YES  
Route Of Entry - Ingestion: YES  
Health Haz Acute And Chronic: SKIN: HARMFUL IF ABSORBED/IRRITATION.  
IRRITATION/DAMAGE. INGESTION: HARMFUL. NARCOTIC AT HIGH CONCENTRATIONS. CAN  
CAUSE NERVOUS SYSTEM INJURY/BLOOD DISORDERS/LIVER & KIDNEY DAMAGE.  
COMPOUND IS CONSIDERED SLIGHTLY TOXIC.  
Carcinogenicity - NTP: NO  
Carcinogenicity - IARC: NO  
Carcinogenicity - OSHA: NO  
Explanation Carcinogenicity: NONE  
Signs/Symptoms Of Overexp: IRRITATION, NAUSEA, HEADACHE, DIZZINESS, GI  
DISTURBANCES.  
Emergency/First Aid Proc: EYES: FLUSH CONTINUOUSLY W/WATER FOR 15-20 MINS.  
SKIN: FLUSH W/WATER FOR 15-20 MINS. IF NOT BURNED, WASH W/SOAP & WATER TO  
CLEANSE. INHALATION: REMOVE TO FRESH AIR. GIVE CPR/OXYGEN IF NEEDED &  
CONTINUE UNTIL MEDICAL ASSISTANCE ARRIVES. OBTAIN MEDICAL ATTENTION IN ALL  
CASES.

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Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROPRIATE OSHA  
REGULATED EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE/SIMILAR  
MATERIAL. SWEEP UP & PLACE IN APPROPRIATE CONTAINER/HOLD FOR DISPOSAL. WASH  
CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.  
Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN  
AFTERBURNER & SCRUBBER IAW/FEDERAL, STATE & LOCAL REGULATIONS.  
Precautions-Handling/Storing: STORE IN A COOL DRY PLACE ONLY W/COMPATIBLE  
CHEMICALS. KEEP TIGHTLY CLOSED.  
Other Precautions: AVOID CONTACT W/SKIN, EYES & CLOTHING. DON'T BREATHE  
VAPORS. CONTACT LENSES SHOULDN'T BE WORN IN THE LABORATORY. ALL CHEMICALS  
SHOULD BE CONSIDERED HAZARDOUS. AVOID DIRECT PHYSICAL CONTACT.

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Control Measures

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Respiratory Protection: WEAR APPROPRIATE OSHA/MSHA APPROVED SAFETY  
EQUIPMENT.  
Ventilation: CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.  
Eye Protection: EYE SHIELDS

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Transportation Data

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Disposal Data

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Label Data

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Label Required: YES  
Label Status: G  
Common Name: O-781 1,4-DIMETHYLBENZENE  
Special Hazard Precautions: SKIN: HARMFUL IF ABSORBED/IRRITATION.  
IRRITATION/DAMAGE. INGESTION: HARMFUL. NARCOTIC AT HIGH CONCENTRATIONS. CAN  
CAUSE NERVOUS SYSTEM INJURY/BLOOD DISORDERS/LIVER & KIDNEY DAMAGE.  
COMPOUND IS CONSIDERED SLIGHTLY TOXIC. IRRITATION, NAUSEA, HEADACHE,  
DIZZINESS, GI DISTURBANCES.  
Label Name: CHEM SERVICE INC  
Label Street: 660 TOWER LN  
Label P.O. Box: 3108  
Label City: WEST CHESTER  
Label State: PA

Label Zip Code: 19381-3108  
Label Country: US  
Label Emergency Number: 215-692-3026/800-452-9994

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CHEM SERVICE -- ETHYLBENZENE, O-770  
MATERIAL SAFETY DATA SHEET  
NSN: 681000N033034  
Manufacturer's CAGE: 8Y898  
Part No. Indicator: B  
Part Number/Trade Name: ETHYLBENZENE, O-770

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General Information

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Company's Name: CHEM SERVICE INC  
Company's P. O. Box: 3108  
Company's City: WEST CHESTER  
Company's State: PA  
Company's Country: US  
Company's Zip Code: 19381  
Company's Emerg Ph #: 215-692-3026  
Company's Info Ph #: 215-692-3026  
Record No. For Safety Entry: 002  
Tot Safety Entries This Sk#: 002  
Status: SMJ  
Date MSDS Prepared: 01SEP92  
Safety Data Review Date: 22FEB96  
MSDS Serial Number: BZPXM

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Ingredients/Identity Information

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Proprietary: NO  
Ingredient: BENZENE, ETHYL-; (ETHYL BENZENE) (SARA 313)  
Ingredient Sequence Number: 01  
NIOSH (RTECS) Number: DA0700000  
CAS Number: 100-41-4  
OSHA PEL: 100 PPM  
ACGIH TLV: 100 PPM/125STEL

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Physical/Chemical Characteristics

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Appearance And Odor: COLORLESS LIQUID, WITH AROMATIC ODOR  
Boiling Point: 277F,136C  
Melting Point: -139F,-95C  
Vapor Pressure (MM Hg/70 F): 7.1  
Specific Gravity: 0.867  
Solubility In Water: INSOLUBLE

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Fire and Explosion Hazard Data

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Flash Point: 71.6F,22.0C  
Lower Explosive Limit: 1.0%  
Upper Explosive Limit: 6.7%  
Extinguishing Media: USE CARBON DIOXIDE, DRY CHEMICAL POWDER OR SPRAY.  
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED SCBA & FULL  
PROTECTIVE EQUIPMENT (FP N).  
Unusual Fire And Expl Hazrds: NONE SPECIFIED BY MANUFACTURER.

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Reactivity Data

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Stability: YES  
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.  
Materials To Avoid: STRONG OXIDIZING AGENTS.  
Hazardous Decomp Products: EMITS TOXIC FUMES UNDER FIRE CONDITIONS.  
Hazardous Poly Occur: NO  
Conditions To Avoid (Poly): NOT RELEVANT.

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Health Hazard Data

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LD50-LC50 Mixture: LD 50 (ORAL RAT): 3500 MG/KG.

Route Of Entry - Inhalation: YES

Route Of Entry - Skin: YES

Route Of Entry - Ingestion: YES

Health Haz Acute And Chronic: ACUTE: CAN CAUSE EYE AND SKIN IRRITATION.

MAY BE HARMFUL IF ABSORBED THROUGH THE SKIN, INHALED, OR SWALLOWED. CAN BE IRRITATING TO MUCOUS MEMBRANES. PROLONGED EXPOSURE MAY CAUSE NAUSEA/ HEADACHE/DIZZINESS AND/OR EYE DAMAGE. CAN CAUSE NERVOUS SYSTEM INJURY. DUST AND/OR VAPORS CAN CAUSE IRRITATION TO RESPIRATORY TRACT.

Carcinogenicity - NTP: NO

Carcinogenicity - IARC: NO

Carcinogenicity - OSHA: NO

Explanation Carcinogenicity: NOT RELEVANT.

Signs/Symptoms Of Overexp: SEE HEALTH HAZARDS.

Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.

Emergency/First Aid Proc: AN ANTIDOTE IS A SUBSTANCE INTENDED TO COUNTERACT EFT OF POIS. IT SHOULD BE ADMIN BY MD/TRAINED EMER PERS. MED ADVICE CAN BE OBTAINED FROM POIS CTL CTR. EYE: CONTINUOUSLY FLUSH W/WATER FOR AT LEAST 15 MIN. SKIN: FLUSH W/WATER FOR 15-20 MIN. IF NO BURNS HAVE OCCURRED, USE SOAP & WATER TO CLEANSE SKIN. INHAL: REMOVE TO FRESH AIR. ADMIN OXYGEN IF DFCLT BRTHG. IF BRTHG HAS STOPPED, ADMIN (SUP DAT)

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#### Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROP OSHA REGULATED EQUIP. VENT AREA. ABSORB ON VERMICULITE/SIMILAR MATL. SWEEP UP & PLACE IN APPROP CONTR. HOLD FOR DISP. WASH CONTAM SURF TO REMOVE ANY RESIDUES.

Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.

Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER. DISPOSE OF IN ACCORDANCE W/LOCAL, STATE & FEDERAL REGULATIONS (FP N).

Precautions-Handling/Storing: ALL CHEM SHOULD BE CONSIDERED HAZ. AVOID DIRECT PHYSICAL CONT! AVOID CONT W/SKIN, EYES & CLTHG. KEEP TIGHTLY CLSD IN COOL DRY PLACE.

Other Precautions: STORE ONLY W/COMPATIBLE CHEM. PERS NOT SPECIFICALLY & PROPERLY TRAINED SHOULD NOT HANDLE THIS CHEM/ITS CONTR. THIS MSDS IS PROVIDED W/OUT ANY WARRANTY EXPRESSED/IMPLIED, INCL MERCHANTABILITY/FITNESS FOR ANY PARTICULAR PURPOSE. (SUP DAT)

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#### Control Measures

---

Respiratory Protection: USE NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N).

Ventilation: THIS CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.

Protective Gloves: IMPERVIOUS GLOVES (FP N).

Eye Protection: ANSI APPRVD CHEM WORKERS GOGGS (FP N).

Other Protective Equipment: EMERGENCY EYEWASH & DELUGE SHOWER MEETING ANSI DESIGN CRITERIA (FP N).

Work Hygienic Practices: CONTACT LENSES SHOULD NOT BE WORN IN THE LABORATORY.

Suppl. Safety & Health Data: FIRST AID PROC: ARTF RESP. IF PATIENT IS IN CARD ARREST ADMIN CPR. CONTINUE LIFE SUPPORTING MEASURES UNTIL MED ASSIST HAS ARRIVED. OTHER PREC: THIS PROD IS FURNISHED FOR LAB USE ONLY! MAY NOT BE USED AS DRUGS, COSMETICS, AGRICULTURAL/PESTICIDAL PROD, FOOD ADDITIVES/ AS HOUSEHOLD CHEMICALS.

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#### Transportation Data

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#### Disposal Data

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#### Label Data

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Label Required: YES  
Technical Review Date: 22FEB96  
Label Date: 22FEB96  
Label Status: B  
Common Name: ETHYLBENZENE, O-770  
Chronic Hazard: NO  
Signal Word: DANGER!  
Acute Health Hazard-Moderate: X  
Contact Hazard-Slight: X  
Fire Hazard-Severe: X  
Reactivity Hazard-None: X  
Special Hazard Precautions: EXTREMELY FLAMMABLE. ACUTE: CAN CAUSE EYE AND SKIN IRRITATION. MAY BE HARMFUL IF ABSORBED THROUGH THE SKIN, INHALED, OR SWALLOWED. CAN BE IRRITATING TO MUCOUS MEMBRANES. PROLONGED EXPOSURE MAY CAUSE NAUSEA/HEADACHE/DIZZINESS AND/OR EYE DAMAGE. CAN CAUSE NERVOUS SYSTEM INJURY. DUST AND/OR VAPORS CAN CAUSE IRRITATION TO RESPIRATORY TRACT. CHRONIC: NONE SPECIFIED BY MANUFACTURER.  
Protect Eye: X  
Protect Skin: X  
Protect Respiratory: X  
Label Name: CHEM SERVICE INC  
Label P.O. Box: 3108  
Label City: WEST CHESTER  
Label State: PA  
Label Zip Code: 19381  
Label Country: US  
Label Emergency Number: 215-692-3026

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CHEM SERVICE - FLUOROBENZENE, O-684  
MATERIAL SAFETY DATA SHEET  
NSN: 681000N067813  
Manufacturer's CAGE: 8Y898  
Part No. Indicator: A  
Part Number/Trade Name: FLUOROBENZENE, O-684

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General Information

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Company's Name: CHEM SERVICE INC  
Company's P. O. Box: 3108  
Company's City: WEST CHESTER  
Company's State: PA  
Company's Country: US  
Company's Zip Code: 19381  
Company's Emerg Ph #: 215-692-3026  
Company's Info Ph #: 215-692-3026  
Safety Data Action Code: C  
Record No. For Safety Entry: 001  
Tot Safety Entries This Stk#: 001  
Status: SMJ  
Date MSDS Prepared: 01SEP88  
Safety Data Review Date: 31JAN96  
MSDS Serial Number: CBGNJ  
Hazard Characteristic Code: NK

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Ingredients/Identity Information

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Proprietary: NO  
Ingredient: BENZENE, FLUORO-; (FLUOROBENZENE)  
Ingredient Sequence Number: 01  
NIOSH (RTECS) Number: DA0800000  
CAS Number: 462-06-6  
OSHA PEL: N/K (FP N)  
ACGIH TLV: N/K (FP N)

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Physical/Chemical Characteristics

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Appearance And Odor: COLORLESS LIQUID.  
Boiling Point: 185F, 85C  
Melting Point: -44F, -42C  
Specific Gravity: 1.024  
Evaporation Rate And Ref: NOT KNOWN  
Solubility In Water: INSOL (IMMISICIBLE)

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Fire and Explosion Hazard Data

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Flash Point: 10F, -12C  
Extinguishing Media: CARBON DIOXIDE, DRY CHEMICAL POWDER OR WATER SPRAY.  
Special Fire Fighting Proc: USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N). THIS IS A FLAMMABLE CHEMICAL.  
Unusual Fire And Expl Hazrds: NONE SPECIFIED BY MANUFACTURER.

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Reactivity Data

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Stability: YES  
Cond To Avoid (Stability): FLAMMABLE.  
Materials To Avoid: INCOMPATIBLE WITH STRONG OXIDIZING AGENTS.  
Hazardous Decomp Products: NONE SPECIFIED BY MANUFACTURER. \*  
Hazardous Poly Occur: NO \*  
Conditions To Avoid (Poly): NOT RELEVANT. \*

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Health Hazard Data

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LD50-LC50 Mixture: LD50:(RAT) 4399 MG/KG \*

Route Of Entry - Inhalation: YES \*

Route Of Entry - Skin: YES \*

Route Of Entry - Ingestion: YES \*

Health Haz Acute And Chronic: CONTACT LENSES SHOULD NOT BE WORN IN LABORATORY. ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS - AVOID DIRECT PHYSICAL CONTACT! CAN BE HARMFUL IF ABSORBED THROUGH THE SKIN. CAN BE HARMFUL IF INHALED. LACHRYMATOR-CAUSES SEVERE EYE IRRITATION. CAN CAUSE SKIN IRRITATION. CAN CAUSE AN ALLERGIC SKIN (EFTS OF OVEREXP) \*

Carcinogenicity - NTP: NO \*

Carcinogenicity - IARC: NO \*

Carcinogenicity - OSHA: NO \*

Explanation Carcinogenicity: NOT RELEVANT. \*

Signs/Symptoms Of Overexp: HLTH HAZ:REACTION. CAN CAUSE AN ALLERGIC RESPIRATORY REACTION. CAN CAUSE EYE & SKIN IRRITATION. CAN BE HARMFUL IF SWALLOWED. CAN BE IRRITATING TO MUCOUS MEMBRANES. PROLONGED EXPOSURE MAY CAUSE NAUSEA/HEADACHE/DIZZINESS AND/OR EYE DAMAGE. \*

Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER. \*

Emergency/First Aid Proc: AN ANTIDOTE IS SUBSTANCE INTENDED TO COUNTERACT EFT OF A POISON. IT SHOULD BE ADMIN ONLY BY PHYS/TRAINED EMER PERS. MED ADVICE CAN BE OBTAINED FROM POIS CTL CTR. INGEST:CALL MD IMMEDIATELY (FP N). EYES:FLUSH CONTINUOUSLY W/WATER FOR @ LEAST 15 MINS. SKIN:FLUSH W/WATER FOR 15-20 MINS. IF NO BURNS HAVE OCCURRED-USE SOAP & WATER TO CLEANSE SKIN. INHAL:REMOVE PATIENT TO FRESH AIR. ADMIN OXYG (SUDPAT) \*

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#### Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROP OSHA-REGULATED EQUIP. VENTILATE AREA. ABSORB ON VERMICULITE OR SIMILAR MATL. SWEEP UP & PLACE IN APPROP CNTNR. HOLD FOR DISPOSAL. WASH CONTAMINATED SURFACES TO REMOVE ANY RESIDUES. \*

Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER. \*

Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER. DISPOSAL MUST BE I/A/W FEDERAL, STATE & LOCAL REGULATIONS (FP N). \*

Precautions-Handling/Storing: USE APPROP NIOSH/MSHA APPRVD SFTY EQUIP. AVOID CONT W/SKIN, EYES & CLTHG. KEEP TIGHTLY CLSD & STORE IN COOL DRY PLACE. STORE ONLY W/COMPAT CHEMICALS. \*

Other Precautions: THIS PRODUCT IS FURNISHED FOR LABORATORY USE ONLY! PRODUCTS MAY NOT BE USED AS DRUGS, COSMETICS, AGRICULTURAL OR PESTICIDAL PRODUCTS, FOOD ADDITIVES OR AS HOUSEHOLD CHEMICALS. \*

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#### Control Measures

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Respiratory Protection: NIOSH/MSHA APPROVED RESPIRATOR. \*

Ventilation: THIS CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD. \*

Protective Gloves: IMPERVIOUS GLOVES (FP N). \*

Eye Protection: ANSI APPRVD CHEM WORKERS GOGGS (SUPDAT) \*

Other Protective Equipment: ANSI APPRVD EMERGENCY EYE WASH & DELUGE SHOWER (FP N). \*

Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER. \*

Suppl. Safety & Health Data: FIRST AID PROC:IF PATIENT IS HAVING DIFFCLTY BRTHG. IF PATIENT HAS STOPPED BRTHG ADMIN ARTF RESP. IF PATIENT IS IN CARD ARREST ADMIN CPR. CONTINUE LIFE SUPPORTING MEASURES UNTIL MED ASSISTANCE HAS ARRIVED. EYE PROT: & FULL LENGTH FACESHIELD (FP N). \*

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#### Transportation Data

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#### Disposal Data

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#### Label Data

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Label Required: YES  
Technical Review Date: 31JAN96  
Label Date: 28DEC95  
Label Status: B  
Common Name: FLUOROBENZENE, O-684  
Chronic Hazard: NO  
Signal Word: DANGER!  
Acute Health Hazard-Slight: X  
Contact Hazard-Severe: X  
Fire Hazard-Severe: X  
Reactivity Hazard-None: X  
Special Hazard Precautions: FLAMMABLE. ALL CHEMICALS SHOULD BE CONSIDERED  
HAZARDOUS - AVOID DIRECT PHYSICAL CONTACT! ACUTE: CAN BE HARMFUL IF  
ABSORBED THROUGH THE SKIN. CAN BE HARMFUL IF INHALED. LACHRYMATOR-CAUSES  
SEVERE EYE IRRITATION. CAN CAUSE SKIN IRRITATION. CAN CAUSE EYE AND SKIN  
IRRITATION. CAN BE HARMFUL IF SWALLOWED. CAN BE IRRITATING TO MUCOUS  
MEMBRANES. CHRONIC: PROLONGED EXPOSURE MAY CAUSE NAUSEA/HEADACHE/DIZZINESS  
AND/OR EYE DAMAGE. CAN CAUSE AN ALLERGIC SKIN REACTION. CAN CAUSE AN  
ALLERGIC RESPIRATORY REACTION.  
Protect Eye: X  
Protect Skin: X  
Protect Respiratory: X  
Label Name: CHEM SERVICE INC  
Label P.O. Box: 3108  
Label City: WEST CHESTER  
Label State: PA  
Label Zip Code: 19381  
Label Country: US  
Label Emergency Number: 215-692-3026

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delete information in this archive please send updates to [dan@siri.org](mailto:dan@siri.org).

CHEM SERVICE - TETRACHLOROETHYLENE, F85  
MATERIAL SAFETY DATA SHEET  
NSN: 681000N052459  
Manufacturer's CAGE: 8Y898  
Part No. Indicator: A  
Part Number/Trade Name: TETRACHLOROETHYLENE, F85

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General Information

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Company's Name: CHEM SERVICE INC  
Company's P. O. Box: 3108  
Company's City: WEST CHESTER  
Company's State: PA  
Company's Country: US  
Company's Zip Code: 19381  
Company's Emerg Ph #: 215-692-3026  
Company's Info Ph #: 215-692-3026  
Record No. For Safety Entry: 001  
Tot Safety Entries This Stk#: 001  
Status: SMJ  
Date MSDS Prepared: 05JUL91  
Safety Data Review Date: 25AUG94  
MSDS Serial Number: BVMHW  
Hazard Characteristic Code: NK

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Ingredients/Identity Information

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Proprietary: NO  
Ingredient: ETHYLENE, TETRACHLORO-; (TETRACHLOROETHYLENE) (SARA III)  
Ingredient Sequence Number: 01  
NIOSH (RTECS) Number: KX3850000  
CAS Number: 127-18-4  
OSHA PEL: 25 PPM  
ACGIH TLV: 25 PPM/100STEL,A3

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Proprietary: NO  
Ingredient: SUPDAT:VOMIT TO AN UNCON/CONVULSING PERSON. IF PATIENT IS  
VOMIT-WATCH CLOSELY TO MAKE SURE AIRWAY DOES NOT (ING 3)  
Ingredient Sequence Number: 02  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

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Proprietary: NO  
Ingredient: ING 2:BECOME OBSTRUCTED BY VOMIT. GET MED ATTN IF NEC. AN  
ANTIDOTE IS SUBSTANCE INTENDED TO COUNTERACT EFT OF (ING 4)  
Ingredient Sequence Number: 03  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

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Proprietary: NO  
Ingredient: ING 3:POISON. IT SHOULD BE ADMIN ONLY BY PHYS/TRAINED EMER  
PERS. MED ADVICE CAN BE OBTAINED FROM POIS CTL CTR.  
Ingredient Sequence Number: 04  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

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Physical/Chemical Characteristics

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Appearance And Odor: COLORLESS LIQUID, ETHER LIKE ODOR  
Boiling Point: 250F,121C  
Melting Point: 71.6F,22.0C

Vapor Pressure (MM Hg/70 F): 14 @20C  
Vapor Density (Air=1): 1.623  
Evaporation Rate And Ref: NOT KNOWN  
Solubility In Water: VERY SLIGHT SOLUBLE

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Fire and Explosion Hazard Data

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Flash Point: NON-FLAMMABLE  
Extinguishing Media: NO FIRE OR EXPLOSION. MEDIA SUITABLE FOR SURROUNDING FIRE CONDITIONS (FP N).  
Special Fire Fighting Proc: USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).  
Unusual Fire And Expl Hazrds: NO EXPLOSION LIMITS ARE AVAIL FOR THIS COMPOUND.

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Reactivity Data

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Stability: YES  
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.  
Materials To Avoid: STRONG BASES. DECOMPOSITION LIBERATES TOX FUMES.  
Hazardous Decomp Products: DECOMPOSITION PRODUCTS ARE CORROSIVE. EMITS TOXIC FUMES UNDER FIRE CONDITIONS.  
Hazardous Poly Occur: NO  
Conditions To Avoid (Poly): NOT RELEVANT.

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Health Hazard Data

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LD50-LC50 Mixture: LD50:(ORAL,RAT)8850 MG/KG  
Route Of Entry - Inhalation: YES  
Route Of Entry - Skin: YES  
Route Of Entry - Ingestion: YES  
Health Haz Acute And Chronic: CONT LENSES SHOULD NOT BE WORN IN LAB. ALL CHEM SHOULD BE CONSIDERED HAZ. AVOID DIRECT PHYSICAL CONTACT! SUSPECTED CARCINOGEN - MAY PRODUCE CANCER. CAN CAUSE EYE IRRIT. CAN CAUSE SKIN IRRIT. DUST AND/OR VAPORS CAN CAUSE IRRIT TO RESP TRACT. CAN BE IRRITATING TO MUCOUS MEMBRANES. MAY BE HARMFUL IF (EFTS OF OVEREXP)  
Carcinogenicity - NTP: YES  
Carcinogenicity - IARC: YES  
Carcinogenicity - OSHA: NO  
Explanation Carcinogenicity: TETRACHLOROETHYLENE:IARC MONOGRAPHS, SUPPLEMENT, VOL 7, PG 355, 1987:GROUP 2B. NTP 6TH ANNUAL REPORT ON (SUPDAT)  
Signs/Symptoms Of Overexp: HLTH HAZ:ABSORB THRU SKIN. MAY BE HARMFUL IF INHALED OR SWALLOWED. PRLNGD EXPOS MAY CAUSE NAUS/HDCH/DIZZ AND/OR EYE DMG. EXPOS CAN CAUSE LIVER DMG. EXPOS CAN CAUSE KIDNEY DMG. AVOID CONSUMPTION OF ALCOHOL BEFORE & AFTER HNDLG OF THIS CMPD BECAUSE IT WILL INCREASE TOX OF CMPD. CAN CAUSE DELAYED ADVERSE (SUPDAT)  
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.  
Emergency/First Aid Proc: INGEST:CALL MD IMMEDIATELY (FP N). EYES: FLUSH CONTINUOUSLY W/WATER FOR 15-20 MIN. SKIN:FLUSH W/WATER FOR 15-20 MIN. IF NO BURNS HAVE OCCURRED-USE SOAP & WATER TO CLEANSE SKIN. INHAL:REMOVE PATIENT TO FRESH AIR. ADMIN OXYG IF PATIENT IS HAVING DFCLTY BRTHG. IF PATIENT HAS STOPPED BRTHG ADMIN ARTF RESP. IF PATIENT IS IN CARDIAC ARREST ADMIN CPR. CONTINUE LIFE SUPPORTING MEASURES UNTIL MED (SUPDAT)

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Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROP OSHA REGULATED EQUIP. VENTILATE AREA. ABSORB ON VERMICULITE/SIMILAR MATL. SWEEP UP & PLACE IN AN APPROP CNTNR. HOLD FOR DISP. WASH CONTAMD SURF TO REMOVE ANY RESIDUES.  
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.  
Waste Disposal Method: BURN IN A CHEM INCIN EQUIPPED W/AN AFTERBURNER & SCRUBBER. DISPOSAL MUST BE I/A/W FEDERAL, STATE & LOCAL REGULATIONS (FP N).  
Precautions-Handling/Storing: EYE SHIELDS SHOULD BE WORN. USE APPROP OSHA/

MSHA APPRVD SFTY EQUIP. STORE ONLY W/COMPATIBLE CHEMICALS.  
Other Precautions: AVOID CONT W/SKIN, EYES AND CLTHG. KEEP TIGHTLY CLSD IN COOL DRY PLACE.

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Control Measures

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Respiratory Protection: NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N).  
Ventilation: THIS CHEM SHOULD BE HANDLED ONLY IN A HOOD.  
Protective Gloves: IMPERVIOUS GLOVES (FP N).  
Eye Protection: ANSI APPRVD CHEMICAL WORK GOGGS (FP N).  
Other Protective Equipment: NONE SPECIFIED BY MANUFACTURER.  
Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.  
Suppl. Safety & Health Data: EXPLAN OF CARCIN:CARCINOGENS, 1991:ANTIC TO BE CARCIN. ANIMAL:LIVER TUMORS. EFTS OF OVEREXP:HLTH EFTS. NARCOTIC @ HIGH CONC. FIRST AID PROC:ASSISTANCE HAS ARRIVED. REMOVE & WASH CONTAMD CLTHG. IF PATIENT IS EXHIBITING SIGNS OF SHOCK-KEEP WARM & QUIET. CONT POIS CTL CTR IMMED IF NEC. DO NOT ADMIN LIQ/INDUCE (ING 2)

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Transportation Data

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Disposal Data

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Label Data

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Label Required: YES  
Technical Review Date: 25AUG94  
Label Date: 29AUG94  
Label Status: G  
Common Name: TETRACHLOROETHYLENE, F85  
Chronic Hazard: YES  
Signal Word: WARNING!  
Acute Health Hazard-Moderate: X  
Contact Hazard-Moderate: X  
Fire Hazard-None: X  
Reactivity Hazard-None: X  
CAN CAUSE EYE AND SKIN IRRITATION. DUST AND/OR VAPOR CAN IRRITATE RESPIRATORY TRACT. CAN IRRITATE MUCOUS MEMBRANES. MAY BE HARFUL IF INHALED, INGESTED OR ABSORBED THROUGH SKIN. PROLONGED EXPOSURE MAY CAUSE NAUSEA, HEADACHE, DIZZINESS AND/OR EYE DAMAGE. CHRONIC:CANCER HAZARD. TETRACHLOROETHYLENE IS LISTED AS AN ANIMAL LIVER CARCINOGEN (FP N). CAN CAUSE LIVER AND KIDNEY DAMAGE.  
Protect Eye: Y  
Protect Skin: Y  
Protect Respiratory: Y  
Label Name: CHEM SERVICE INC  
Label P.O. Box: 3108  
Label City: WEST CHESTER  
Label State: PA  
Label Zip Code: 19381  
Label Country: US  
Label Emergency Number: 215-692-3026

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CHEM SERVICE - TOLUENE, F86  
MATERIAL SAFETY DATA SHEET  
NSN: 681000N052458  
Manufacturer's CAGE: 8Y898  
Part No. Indicator: A  
Part Number/Trade Name: TOLUENE, F86

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General Information

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Company's Name: CHEM SERVICE INC  
Company's P. O. Box: 3108  
Company's City: WEST CHESTER  
Company's State: PA  
Company's Country: US  
Company's Zip Code: 19381  
Company's Emerg Ph #: 215-692-3026  
Company's Info Ph #: 215-692-3026  
Record No. For Safety Entry: 001  
Tot Safety Entries This Stk#: 001  
Status: SMJ  
Date MSDS Prepared: 05JUL91  
Safety Data Review Date: 30AUG94  
MSDS Serial Number: BVMHV  
Hazard Characteristic Code: NK

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Ingredients/Identity Information

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Proprietary: NO  
Ingredient: TOLUENE (SARA III)  
Ingredient Sequence Number: 01  
NIOSH (RTECS) Number: XS5250000  
CAS Number: 108-88-3  
OSHA PEL: 200 PPM  
ACGIH TLV: 50 PPM, S

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Proprietary: NO  
Ingredient: SUPP DATA: PATIENT IS VOMIT-WATCH CLOSELY TO MAKE SURE AIRWAY  
DOES NOT BECOME OBSTRUCTED BY VOMIT. GET MED ATTN IF (ING 3)  
Ingredient Sequence Number: 02  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

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Proprietary: NO  
Ingredient: ING 2: NEC. AN ANTIDOTE IS A SUBSTANCE INTENDED TO COUNTERACT  
EFT OF A POIS. IT SHOULD BE ADMIN ONLY BY MD/TRAINED (ING 4)  
Ingredient Sequence Number: 03  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

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Proprietary: NO  
Ingredient: ING 3: EMERGENCY PERSONNEL. MEDICAL ADVICE CAN BE OBTAINED FROM  
A POISON CONTROL CENTER.  
Ingredient Sequence Number: 04  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

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Proprietary: NO  
Ingredient: OTHER PREC: CHEMICALS. READILY ABSORBED & RETAINED ON CLOTHING  
&/OR SHOES.  
Ingredient Sequence Number: 05  
Percent: AN/K

NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

Proprietary: NO  
Ingredient: EYE PROT:& FULL LENGTH FACE SHIELD (FP N).  
Ingredient Sequence Number: 06  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

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#### Physical/Chemical Characteristics

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Appearance And Odor: COLORLESS LIQUID; AROMATIC ODOR.  
Boiling Point: >231F,>111C  
Melting Point: 203F,95C  
Vapor Pressure (MM Hg/70 F): 22 @ 20C  
Vapor Density (Air=1): 3.1  
Specific Gravity: 0.886  
Evaporation Rate And Ref: 1.9 (BUTYL ACETATE=1)  
Solubility In Water: VERY SLIGHTLY SOL

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#### Fire and Explosion Hazard Data

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Flash Point: 39.9F,4.4C  
Lower Explosive Limit: 1.2%  
Upper Explosive Limit: 7.1%  
Extinguishing Media: CARBON DIOXIDE OR DRY CHEMICAL POWDER. DO NOT USE WATER!  
Special Fire Fighting Proc: USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).  
Unusual Fire And Expl Hazrds: THIS IS A FLAMMABLE CHEMICAL.

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#### Reactivity Data

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Stability: YES  
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.  
Materials To Avoid: INCOMPATIBLE W/STRONG OXIDIZING AGENTS.  
Hazardous Decomp Products: DECOMPOSITION LIBERATES TOXIC FUMES.  
Hazardous Poly Occur: NO  
Conditions To Avoid (Poly): NOT RELEVANT

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#### Health Hazard Data

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LD50-LC50 Mixture: LD50:(ORAL,RAT) 5000 MG/KG.  
Route Of Entry - Inhalation: YES  
Route Of Entry - Skin: YES  
Route Of Entry - Ingestion: YES  
Health Haz Acute And Chronic: CAN CAUSE EYE/SKIN IRRIT. MAY BE HARMFUL IF INHALED, SWALLOWED/ABSORBED THRU SKIN. EXPOS CAN CAUSE LIVER/KIDNEY DMG. PRLNG EXPOS MAY CAUSE NAUS, HDCH, DIZZ &/OR EYE DMG. DUST &/OR VAP CAN CAUSE IRRIT TO RESP TRACT. CAN BE IRRIT TO MUC MEMBS. CAN CAUSE GI DISTURBS & BLOOD DISORDERS. AVOID CONSUMPTION OF(EFTS OF OVEREXP)  
Carcinogenicity - NTP: NO  
Carcinogenicity - IARC: NO  
Carcinogenicity - OSHA: NO  
Explanation Carcinogenicity: NOT RELEVANT  
Signs/Symptoms Of Overexp: HLTH HAZ:ALCOHOL BEFORE & AFTER HNDLG THIS CMPD BECAUSE IT WILL INCR TOX OF CMPD. MAY BE RAPIDLY ABSORBED THRU SKIN W/ POTNTL ADVERSE HLTH EFTS. CAN CAUSE DELAYED ADVERSE HLTH EFTS & NERV SYS INJURY. NARCOTIC AT HIGH CONCS. NOTE:TOLUENE APPEARS ON NAVY LIST OF OCCUP CHEM REPRO HAZS. SEEK CONSULTATION FROM (SUPP DATA)  
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.  
Emergency/First Aid Proc: EYES:FLUSH CONTINUOUSLY W/WATER FOR AT LST 15-20

MINS. SKIN: FLUSH W/WATER FOR 15-20 MINS. IF NO BURNS HAVE OCCURRED- USE SOAP & WATER TO CLEANSE SKIN. REMOVE & WASH CONTAM CLTHG. INHAL: REMOVE PATIENT TO FRESH AIR. ADMIN OXYGEN IF PATIENT IS HAVING DIFFICULTY BRTHG. IF PATIENT HAS STOPPED BRTHG ADMIN ARTF RESP. IF PATIENT IS IN CARDIAC ARREST ADMIN CPR. CONTINUE LIFE SUPPORTING MEASURES UNTIL (SUPDAT)

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Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROPRIATE NIOSH/MSHA APPROVED NIOSH/MSHA APPROVED REGULATED EQUIP. VENTILATE AREA ABSORB ON VERMICULITE OR SIMILAR MATL. SWEEP UP & PLACE IN APPROPRIATE CONTAINER. HOLD FOR DISPOSAL. WASH CONTAM SURFACES TO REMOVE ANY RESIDUES.  
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.  
Waste Disposal Method: DISPOSAL MUST BE I/A/W FEDERAL, STATE & LOCAL REGULATIONS (FP N). BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AFTERBURNER & SCRUBBER.  
Precautions-Handling/Storing: FLAMMABLE. AVOID CONTACT W/SKIN, EYES & CLOTHING. KEEP TIGHTLY CLOSED IN A COOL, DRY PLACE. STORE ONLY W/COMPATIBLE CHEMICALS. HYGROSCOPIC.  
Other Precautions: ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS - AVOID DIRECT PHYSICAL CONTACT! THIS PRODUCT IS FURNISHED FOR LAB USE ONLY! OUR PRODS MAY NOT BE USED AS DRUGS, COSMETICS, AGRICULTURAL OR PESTICIDAL PRODS, FOOD ADDITIVES/AS HOUSEHOLD (ING 5)

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Control Measures

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Respiratory Protection: NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N).  
Ventilation: THIS CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.  
Protective Gloves: IMPERVIOUS GLOVES (FP N).  
Eye Protection: ANSI APPROVED CHEM WORKERS GOGGS (ING 6)  
Other Protective Equipment: USE APPROPRIATE NIOSH/MSHA APPROVED SAFETY EQUIPMENT.  
Work Hygienic Practices: CONTACT LENSES SHOULD NOT BE WORN IN THE LABORATORY.  
Suppl. Safety & Health Data: EFTS OF OVEREXP: APPROP HLTH PROFESSIONALS CONCERNING LATEST HAZ LIST INFO & SAFE HANDLG & EXPOS INFO (FP N). FIRST AID PROC: MED ASSISTANCE HAS ARRIVED. IF PATIENT IS EXHIBITING SIGNS OF SHOCK - KEEP WARM & QUIET. INGEST: CONT POIS CTL CTR IMMED IF NEC. DO NOT ADMIN LIQS/INDUCE VOMIT TO UNCON/CONVULSING PERS. IF (ING 2)

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Transportation Data

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Disposal Data

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Label Data

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Label Required: YES  
Technical Review Date: 30AUG94  
Label Date: 26AUG94  
Label Status: G  
Common Name: TOLUENE, F86  
Chronic Hazard: YES  
Signal Word: DANGER!  
Acute Health Hazard-Moderate: X  
Contact Hazard-Slight: X  
Fire Hazard-Severe: X  
Reactivity Hazard-None: X  
Special Hazard Precautions: FLAMMABLE. ACUTE: CAN CAUSE EYE OR SKIN IRRITATION. MAY BE HARMFUL IF INHALED, SWALLOWED OR ABSORBED THRU SKIN. EXPOSURE CAN CAUSE LIVER OR KIDNEY DAMAGE. PROLONGED EXPOSURE MAY CAUSE NAUSEA, HEADACHE, DIZZINESS &/OR EYE DAMAGE. DUST &/OR VAPOR CAN CAUSE



IRRITATION TO RESPIRATORY TRACT. CAN BE IRRITATING TO MUCOUS MEMBRANES. CAN CAUSE GI DISTURBANCES & BLOOD DISORDERS. CAN CAUSE NERVOUS SYSTEM DAMAGE. NARCOTIC AT HIGH CONCENTRATIONS. CHRONIC:TOLUENE APPEARS ON THE NAVY OCCUPATIONAL CHEMICAL REPRODUCTIVE HAZARDS LIST (FP N).

Protect Eye: Y

Protect Skin: Y

Protect Respiratory: Y

Label Name: CHEM SERVICE INC

Label P.O. Box: 3108

Label City: WEST CHESTER

Label State: PA

Label Zip Code: 19381

Label Country: US

Label Emergency Number: 215-692-3026

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URL for this msds <http://siri.org>. If you wish to change, add to, or delete information in this archive please send updates to [dan@siri.org](mailto:dan@siri.org).

CHEM SERVICE - 1,1,1-TRICHLOROETHANE, F11  
MATERIAL SAFETY DATA SHEET  
NSN: 681000N052461  
Manufacturer's CAGE: 8Y898  
Part No. Indicator: A  
Part Number/Trade Name: 1,1,1-TRICHLOROETHANE, F11

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General Information

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Company's Name: CHEM SERVICE INC  
Company's P. O. Box: 3108  
Company's City: WEST CHESTER  
Company's State: PA  
Company's Country: US  
Company's Zip Code: 19381  
Company's Emerg Ph #: 215-692-3026  
Company's Info Ph #: 215-692-3026  
Record No. For Safety Entry: 001  
Tot Safety Entries This Stk#: 001  
Status: SMJ  
Date MSDS Prepared: 03JUL91  
Safety Data Review Date: 26AUG94  
MSDS Serial Number: BVMHY  
Hazard Characteristic Code: NK

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Ingredients/Identity Information

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Proprietary: NO  
Ingredient: ETHANE, 1,1,1-TRICHLORO-; (1,1,1-TRICHLOROETHANE) (SARA III)  
Ingredient Sequence Number: 01  
NIOSH (RTECS) Number: KJ2975000  
CAS Number: 71-55-6  
OSHA PEL: 350 PPM  
ACGIH TLV: 350 PPM/450STEL

Proprietary: NO  
Ingredient: SUPDAT:CAUSE LIVER DMG. EXPOS CAN CAUSE KIDNEY DMG. ALL CHEM  
SHOULD BE CONSIDERED HAZ. AVOID DIRECT PHYSICAL CONTACT.  
Ingredient Sequence Number: 02  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

Proprietary: NO  
Ingredient: FIRST AID PROC:ASSISTANCE HAS ARRIVED. REMOVE & WASH CONTAMD  
CLTHG. IF PATIENT IS EXHIBITING SIGNS OF SHOCK - (ING 4)  
Ingredient Sequence Number: 03  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

Proprietary: NO  
Ingredient: ING 3:KEEP WARM & QUIET. IF SWALLOWED DO NOT INDUCE VOMIT.  
CONT POIS CTL CTR IMMED IF NEC. DO NOT ADMIN LIQ (SUPDAT)  
Ingredient Sequence Number: 04  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

Proprietary: NO  
Ingredient: ING 4:INDUCE VOMIT TO AN UNCON/CONVULSING PERSON. IF PATIENT  
IS VOMIT-WATCH CLOSELY TO MAKE SURE AIRWAY DOES (ING 6)  
Ingredient Sequence Number: 05  
NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

Proprietary: NO

Ingredient: ING 5: NOT BECOME OBSTRUCTED BY VOMIT. GET MED ATTN IF NEC. AN  
ANTIDOTE IS SUBSTANCE INTENDED TO COUNTERACT EFT (ING 7)

Ingredient Sequence Number: 06

NIOSH (RTECS) Number: 999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

Proprietary: NO

Ingredient: ING 6: OF A POISON. IT SHOULD BE ADMINISTERED ONLY BY PHYS/  
TRAINED EMER PERS. MEDICAL ADVICE CAN BE OBTAINED (ING 8)

Ingredient Sequence Number: 07

NIOSH (RTECS) Number: 999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

Proprietary: NO

Ingredient: ING 7: FROM A POISON CONTROL CENTER.

Ingredient Sequence Number: 08

NIOSH (RTECS) Number: 999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

Proprietary: NO

Ingredient: OTHER PRECAUT: THIS PROD IS FURNISHED FOR LABORATORY USE ONLY!  
PRODUCTS MAY NOT BE USED AS DRUGS, COSMETICS, (ING 10)

Ingredient Sequence Number: 09

NIOSH (RTECS) Number: 999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

Proprietary: NO

Ingredient: ING 9: AGRICULTURAL OR PESTICIDAL PRODUCTS, FOOD ADDITIVES OR  
AS HOUSEHOLD CHEMICALS.

Ingredient Sequence Number: 10

NIOSH (RTECS) Number: 999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

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#### Physical/Chemical Characteristics

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Appearance And Odor: COLORLESS LIQUID, FRUITY/PLEASANT ODOR

Boiling Point: 165F, 74C

Melting Point: 90.5F, 32.5C

Vapor Pressure (MM Hg/70 F): 100 @20C

Specific Gravity: 1.3376

Evaporation Rate And Ref: NOT KNOWN

Solubility In Water: SUPP DATA

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#### Fire and Explosion Hazard Data

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Flash Point: NON-FLAMMABLE

Lower Explosive Limit: 7.0%

Upper Explosive Limit: 16.0%

Extinguishing Media: CARBON DIOXIDE, DRY CHEMICAL POWDER OR SPRAY.

Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED PRESSURE DEMAND SCBA  
& FULL PROTECTIVE EQUIPMENT (FP N).

Unusual Fire And Expl Hazrds: THERMAL DECOMP PRODS MAY CONTAIN HCL AND  
PHOSGENE (FP N).

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#### Reactivity Data

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Stability: YES

Cond To Avoid (Stability): DO NOT USE MAGNESIUM/ALUMINUM OR THEIR ALLOYS AS CNTNRS. REACTS VIOLENTLY W/KETONES & WIDE VARIETY OF OTHER CMPDS.

Materials To Avoid: STRONG OXIDIZING AGENTS. INCOMPATIBLE W/IRON & ZINC & OTHER LIGHT METALS. INCOMPATIBLE W/ACTIVE METALS (SUPDAT)

Hazardous Decomp Products: HCL & PHOSGENE (FP N). DECOMPOSITION LIBERATES TOXIC FUMES.

Hazardous Poly Occur: NO

Conditions To Avoid (Poly): NOT RELEVANT.

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#### Health Hazard Data

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LD50-LC50 Mixture: LD50:(ORAL, RAT)10300 MG/KG

Route Of Entry - Inhalation: YES

Route Of Entry - Skin: YES

Route Of Entry - Ingestion: YES

Health Haz Acute And Chronic: CHLOROCARBON MATLS HAVE PRDCEED SENSIT OF MYOCARDIUM TO EPINEPHRINE IN LAB ANIMALS & COULD HAVE A SIMILAR EFT IN HUMANS. ADRENOMIMETICS (E.G. EPINEPHRINE) MAY BE CONTRAINDICATED EXCEPT FOR LIFE-SUSTAINING USES IN HUMANS ACUTELY OR CHRONICALLY EXPOSED TO CHLOROCARBONS (FP N). CONT LENSES SHOULD NOT BE (EFTS OF OVEREXP)

Carcinogenicity - NTP: NO

Carcinogenicity - IARC: NO

Carcinogenicity - OSHA: NO

Explanation Carcinogenicity: NOT RELEVANT.

Signs/Symptoms Of Overexp: HLTH HAZ: WORN IN LAB. ALL CHEM SHOULD BE CONSIDERED HAZ. AVOID DIRECT PHYSICAL CONT! CAN CAUSE EYE IRRIT. CAN BE IRRITATING TO MUC MEMB. NARCOTIC @ HIGH CONC. POSS CARCIN. MAY BE HARMFUL IF ABSORBED THRU SKIN. MAY BE HARMFUL IF INHALED. MAY BE HARMFUL IF SWALLOWED. CAN CAUSE SKIN IRRIT. DUST AND/OR VAP CAN (SUPDAT)

Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.

Emergency/First Aid Proc: INGEST: CALL MD IMMEDIATELY (FP N). EYES: FLUSH CONTINUOUSLY W/WATER FOR 15-20 MIN. SKIN: FLUSH W/WATER FOR 15-20 MIN. IF NO BURNS HAVE OCCURRED-USE SOAP & WATER TO CLEANSE SKIN. INHAL: REMOVE PATIENT TO FRESH AIR. ADMIN OXYG IF PATIENT IS HAVING DFCLTY BRTHG. IF PATIENT HAS STOPPED BRTHG ADMIN ARTF RESP. IF PATIENT IS IN CARDIAC ARREST ADMIN CPR. CONTINUE LIFE SUPPORTING MEASURES UNTIL MED (ING 3)

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#### Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROP OSHA REGULATED EQUIP. VENTILATE AREA. ABSORB ON VERMICULITE/SIMILAR MATL. SWEEP UP & PLACE IN APPROP CNTNR. HOLD FOR DISP. WASH CONTAMD SURF TO REMOVE ANY RESIDUES.

Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.

Waste Disposal Method: BURN IN CHEM INCIN EQUIPPED W/AN AFTERBURNER & SCRUBBER. DISPOSAL MUST BE I/A/W FEDERAL, STATE & LOCAL REGULATIONS (FP N).

Precautions-Handling/Storing: THIS CHEM SHOULD BE HANDLED ONLY IN HOOD. EYE SHIELDS SHOULD BE WORN. USE APPROP OSHA/MSHA APPRVD SFTY EQUIP. STORE ONLY WITH COMPATIBLE CHEMICALS.

Other Precautions: AVOID CONT W/SKIN, EYES & CLTHG. KEEP TIGHTLY CLSD IN COOL DRY PLACE. NO SMOKING IN AREA OF USE. DO NOT USE IN GEN VICINITY OF ARC WELDING, OPEN FLAMES/HOT SURF. HEAT &/OR UV RADIA MAY CAUSE FORMATION OF HCL &/OR PHOSGENE (FP N). (ING 9)

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#### Control Measures

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Respiratory Protection: NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N).

Ventilation: THIS CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.

Protective Gloves: IMPERVIOUS GLOVES (FP N).

Eye Protection: ANSI APPRVD CHEM WORK GOGG (FP N).

Other Protective Equipment: NONE SPECIFIED BY MANUFACTURER.

Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.

Suppl. Safety & Health Data: SOL IN H<sub>2</sub>O: VERY SLIGHTLY SOLUBLE. MATLS TO AVOID: (E.G. SODIUM). INCOMPATIBLE W/POWDERED METALS, NITRATES AND W/ CAUSTICS. EFTS OF OVEREXP: CAUSE IRRIT TO RESP TRACT. AVOID CONSUMPTION OF ALCOHOL BEFORE & AFTER HANDLING OF CMPD BECAUSE IT WILL INCREASE TOX OF CMPD. CAN CAUSE AN ALLERGIC SKIN REACTION. EXPOS CAN (ING 2)

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Transportation Data

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Disposal Data

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Label Data

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Label Required: YES

Technical Review Date: 26AUG94

Label Date: 29AUG94

Label Status: G

Common Name: 1,1,1-TRICHLOROETHANE, F11

Chronic Hazard: YES

Signal Word: WARNING!

Acute Health Hazard-Moderate: X

Contact Hazard-Moderate: X

Fire Hazard-None: X

Reactivity Hazard-None: X

Special Hazard Precautions: ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS. AVOID DIRECT PHYSICAL CONTACT. ACUTE: INHALATION OF MIST OR VAPOR MAY CONTRIBUTE TO THE OCCURRENCE OF IRREGULAR HEARTBEAT (FP N). CAN CAUSE EYE IRRITATION. CAN IRRITATE MUCOUS MEMBRANES. NARCOTIC AT HIGH CONCENTRATION. MAY BE HARMFUL IF ABSORBED THROUGH SKIN. MAY BE HARMFUL IF INHALED OR SWALLOWED. CHRONIC: CAN CAUSE LIVER AND KIDNEY DAMAGE.

Protect Eye: Y

Protect Skin: Y

Protect Respiratory: Y

Label Name: CHEM SERVICE INC

Label P.O. Box: 3108

Label City: WEST CHESTER

Label State: PA

Label Zip Code: 19381

Label Country: US

Label Emergency Number: 215-692-3026

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CHEM SERVICE -- TRICHLOROETHYLENE, F87  
MATERIAL SAFETY DATA SHEET  
NSN: 681000N052457  
Manufacturer's CAGE: 8Y898  
Part No. Indicator: A  
Part Number/Trade Name: TRICHLOROETHYLENE, F87

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General Information

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Company's Name: CHEM SERVICE INC  
Company's P. O. Box: 3108  
Company's City: WEST CHESTER  
Company's State: PA  
Company's Country: US  
Company's Zip Code: 19381  
Company's Emerg Ph #: 215-692-3026  
Company's Info Ph #: 215-692-3026  
Record No. For Safety Entry: 001  
Tot Safety Entries This Std#: 001  
Status: SMJ  
Date MSDS Prepared: 01JUN89  
Safety Data Review Date: 01SEP94  
MSDS Serial Number: BVMHT  
Hazard Characteristic Code: NK

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Ingredients/Identity Information

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Proprietary: NO  
Ingredient: ETHYLENE, TRICHLORO-; (TRICHLOROETHENE) (SARA III)  
Ingredient Sequence Number: 01  
NIOSH (RTECS) Number: KX4550000  
CAS Number: 79-01-6  
OSHA PEL: 100 PPM  
ACGIH TLV: 50 PPM;100 STEL

Proprietary: NO  
Ingredient: SUPDAT:ARREST ADMIN CPR. CONTINUE LIFE SUPPORTING MEASURES  
UNTIL MED ASSISTANCE HAS ARRIVED. IF PATIENT IS (ING 3)  
Ingredient Sequence Number: 02  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

Proprietary: NO  
Ingredient: ING 2:EXHIBITING SIGNS OF SHOCK - KEEP WARM & QUIET. CONT POIS  
CTL CTR IMMED IF NEC. DO NOT ADMIN LIQS/INDUCE (ING 4)  
Ingredient Sequence Number: 03  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

Proprietary: NO  
Ingredient: ING 3:VOMIT TO UNCON/CONVULSING PERS. IF PATIENT IS VOMIT -  
WAAATCH CLOSELY TO MAKE SURE AIRWAY DOES NOT BECOME (ING 5)  
Ingredient Sequence Number: 04  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

Proprietary: NO  
Ingredient: ING 4:OBSTRUCTED BY VOMIT. GET MEDICAL ATTENTION IF NECESSARY.  
Ingredient Sequence Number: 05  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

Proprietary: NO

Ingredient: OTHER PREC: VICIN OF ARC WELDING, OPEN FLAMES/HOT SURFS. HEAT  
&/OR UV RADIA MAY CAUSE FORM OF HCL &/OR PHOSGENE (FP N).

Ingredient Sequence Number: 06

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

Proprietary: NO

Ingredient: EYE PROT:& FULL LENGTH FACE SHIELD (FP N).

Ingredient Sequence Number: 07

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

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#### Physical/Chemical Characteristics

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Appearance And Odor: COLORLESS LIQUID; FRUITY/PLEASANT ODOR.

Boiling Point: 188F,87C

Melting Point: -121F,-85C

Vapor Pressure (MM Hg/70 F): 58 @ 20C

Vapor Density (Air=1): 4.53

Specific Gravity: 1.4649

Solubility In Water: VERY SLIGHTLY SOL

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#### Fire and Explosion Hazard Data

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Flash Point: NON-FLAMMABLE

Lower Explosive Limit: 11%

Upper Explosive Limit: 41%

Extinguishing Media: MEDIA SUITABLE FOR SURROUNDING FIRE (FP N).

Special Fire Fighting Proc: USE NIOSH/MSHA APPROVED PRESSURE DEMAND SCBA &  
FULL PROTECTIVE EQUIPMENT (FP N).

Unusual Fire And Expl Hazrds: THERMAL DECOMPOSITION PRODUCTS MAY INCLUDE  
HCL & PHOSGENE (FP N). NO FIRE OR EXPLOSION HAZARD.

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#### Reactivity Data

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Stability: YES

Cond To Avoid (Stability): SENSITIVE TO LIGHT - DARK COLOR DOES NOT AFFECT  
PURITY.

Materials To Avoid: INCOMPAT W/STRONG REDUCING AGENTS, STRONG BASES,  
STRONG OXIDIZING AGENTS. DO NOT USE MAGNESIUM/ALUMINUM/THEIR (SUPDAT)

Hazardous Decomp Products: DECOMPOSITION LIBERATES TOXIC FUMES.

DECOMPOSITION PRODUCTS ARE CORROSIVE. HCL, PHOSGENE (FP N).

Hazardous Poly Occur: NO

Conditions To Avoid (Poly): NOT RELEVANT

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#### Health Hazard Data

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LD50-LC50 Mixture: LD50:(ORAL,RAT) 7193 MG/KG.

Route Of Entry - Inhalation: YES

Route Of Entry - Skin: YES

Route Of Entry - Ingestion: YES

Health Haz Acute And Chronic: CAN BE HARMFUL IF ABSORBED THRU SKIN,  
INHALED/SWALLOWED. SUSPECTED CARCIN-MAY PRDCE CANCER. LACHRYMATOR-CAUSES  
SEV EYE IRRIT. VAPS &/OR DIRECT EYE CONT CAN CAUSE SEV EYE BURNS. CAN CAUSE  
EYE/SKIN IRRIT. CAN CAUSE SKIN BURNS. CAN CAUSE SEV SKIN BURNS. CAN CAUSE  
LIVER/KIDNEY INJURY. CAN CAUSE GI (EFTS OF OVEREXP)

Carcinogenicity - NTP: NO

Carcinogenicity - IARC: NO

Carcinogenicity - OSHA: NO

Explanation Carcinogenicity: NOT RELEVANT

Signs/Symptoms Of Overexp: HLTH HAZ: DISTURBS. CAN BE IRRIT TO MUC MEMBS.  
PRLNG EXPOS MAY CAUSE NAUS, HDCH, DIZZ &/OR EYE DMG. CAN CAUSE SENSIT BY  
SKIN CONT. MAY BE RAPIDLY ABSORBED THRU SKIN W/POTNTL ADVERSE HLTH EFTS.  
CHLOROCARBON MATLS HAVE PRDCTD SENSIT OF MYOCARDIUM TO EPINEPHRINE IN LAB  
ANIMALS & COULD HAVE SIMILAR EFTS IN HUMANS. (SUPDAT)

Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER

Emergency/First Aid Proc: AN ANTIDOTE IS SUBSTANCE INTENDED TO COUNTERACT  
EFT OF POIS. IT SHOULD BE ADMIN ONLY BY MD/TRAINED EMER PERS. MED ADVICE  
CAN BE OBTAINED FROM POIS CTL CTR. EYES: FLUSH CONTINUOUSLY W/ WATER FOR AT  
LST 15-20 MINS. SKIN: FLUSH W/WATER FOR 15-20 MINS. IF NO BURNS HAVE  
OCCURRED-USE SOAP & WATER TO CLEANSE SKIN. REMOVE & WASH CONTAM CLTHG.  
INHAL: REMOVE PATIENT TO FRESH AIR. ADMIN OXYGEN IF PATIENT(SUPDAT)

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#### Precautions for Safe Handling and Use

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Steps If Mat Released/Spill: EVACUATE AREA. WEAR APPROP OSHA REGULATED  
EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE OR SIMILAR MATERIAL. SWEEP  
UP & PLACE IN APPROPRIATE CONTAINER. HOLD FOR DISPOSAL. WASH CONTAMINATED  
SURFACES TO REMOVE ANY RESIDUES.

Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER

Waste Disposal Method: DISPOSAL MUST BE I/A/W FEDERAL, STATE & LOCAL  
REGULATIONS (FP N). BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN  
AFTERBURNER & SCRUBBER

Precautions-Handling/Storing: ALL CHEMS SHOULD BE CONSIDERED HAZ - AVOID  
DIRECT PHYSICAL CONT. AVOID CONT W/SKIN, EYES & CLTHG. KEEP TIGHTLY CLSD IN  
COOL, DRY PLACE.

Other Precautions: STORE ONLY W/COMPAT CHEMS. THIS PROD IS FURNISHED FOR  
LAB USE ONLY! MFR'S PRODS MAY NOT BE USED AS DRUGS, COSMETICS,  
AGRICULTURAL/PESTICIDAL PRODS, FOOD ADDITIVES/AS HOUSEHOLD CHEMS. NO  
SMOKING IN AREA OF USE. DO NOT USE IN GEN (ING 6)

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#### Control Measures

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Respiratory Protection: NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR  
EXPOSURE OF CONCERN (FP N).

Ventilation: THIS CHEMICAL SHOULD ONLY BE HANDLED IN A HOOD.

Protective Gloves: IMPERVIOUS GLOVES (FP N).

Eye Protection: ANSI APPROVED CHEM WORKERS GOGGS (ING 7)

Other Protective Equipment: EMERGENCY EYE WASH & DELUGE SHOWER WHICH MEET  
ANSI DESIGN CRITERIA (FP N). USE APPROP NIOSH/MSHA APPRVD SFTY EQUIP.

Work Hygienic Practices: CONTACT LENSES SHOULD NOT BE WORN IN THE  
LABORATORY.

Suppl. Safety & Health Data: MATLS TO AVOID: ALLOYS AS CNTNRS. EFTS OF  
OVEREXP: ADRENOMIMETICS (E.G., EPINEPHRINE) MAY BE CONTRAINDICATED EXCEPT  
FOR LIFE-SUSTAINING USES IN HUMANS ACUTELY/CHRONICALLY EXPOS TO  
CHLOROCARBONS (FP N). FIRST AID PROC: IS HAVING DIFFCLTY BRTHG. IF PATIENT HAS  
STOPPED BRTHG ADMIN ARTF RESP. IF PATIENT IS IN CARDIAC (ING 2)

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#### Transportation Data

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#### Disposal Data

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#### Label Data

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Label Required: YES

Technical Review Date: 01SEP94

Label Date: 01SEP94

Label Status: G

Common Name: TRICHLOROETHYLENE, F87

Chronic Hazard: NO

Signal Word: DANGER!



Acute Health Hazard-Slight: X

Contact Hazard-Severe: X

Fire Hazard-None: X

Reactivity Hazard-None: X

Special Hazard Precautions: ACUTE: INHALATION OF VAPORS MAY CONTRIBUTE TO THE OCCURRENCE OF IRREGULAR HEARTBEAT (FP N). CAN BE HARMFUL IF ABSORBED THRU SKIN, INHALED OR SWALLOWED. LACHRYMATOR-CAUSES SEVERE EYE IRRITATION. VAPORS &/OR DIRECT EYE CONTACT CAN CAUSE SEVERE EYE BURNS. CAN CAUSE EYE OR SKIN IRRITATION. CAN CAUSE SEVERE SKIN BURNS. CAN CAUSE LIVER OR KIDNEY INJURY. CAN CAUSE GI DISTURBANCES. MAY BE IRRITATING TO MUCOUS MEMBRANES. MAY CAUSE NAUSEA, HEADACHE, DIZZINESS. CHRONIC: NONE LISTED BY MANUFACTURER.

Protect Eye: Y

Protect Skin: Y

Protect Respiratory: Y

Label Name: CHEM SERVICE INC

Label P.O. Box: 3108

Label City: WEST CHESTER

Label State: PA

Label Zip Code: 19381

Label Country: US

Label Emergency Number: 215-692-3026

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URL for this msds <http://siri.org>. If you wish to change, add to, or delete information in this archive please send updates to [dan@siri.org](mailto:dan@siri.org).

Common Name: Vinyl Chloride  
CAS Number: 75-01-4  
DOT Number UN 1086  
Date: January, 1986

---

#### HAZARD SUMMARY

- Vinyl Chloride can affect you when breathed and by passing through skin.
- Vinyl Chloride is a **CARCINOGEN** **HANDLE WITH EXTREME CAUTION**. It also may cause damage to the developing fetus.
- Exposure can cause you to feel dizzy, lightheaded and sleepy. Higher levels can cause you to pass out and even die.
- Repeated exposure can damage the liver, the bones and blood vessels of the hands, and cause skin changes.
- Vinyl Chloride may cause stomach problems, kidney damage, skin allergy and damage the nervous system and blood.
- It is a **HIGHLY FLAMMABLE LIQUID or GAS** and a **DANGEROUS FIRE HAZARD**.

#### IDENTIFICATION

Vinyl Chloride is a colorless gas usually handled as liquid with a faintly sweet odor. It is used in the plastics industry and to make other chemicals.

#### REASON FOR CITATION

- Vinyl Chloride is on the Hazardous Substance List because it is regulated by OSHA and cited by ACGIH, DOT, NIOSH, IARC, DEP and NFPA.
- This chemical is on the Special Health Hazard Substance List because it is a **CARCINOGEN**, **MUTAGEN** and is **FLAMMABLE**.
- Definitions are attached.

#### HOW TO DETERMINE IF YOU ARE BEING EXPOSED

- Exposure to hazardous substances should be routinely evaluated. This may include collecting air samples. Under OSHA 1910.20, you have a legal right to obtain copies of sampling results from your employer. If you think you are experiencing any work related health problems, see a doctor trained to recognize occupational diseases. Take this Fact Sheet with you.
- **ODOR THRESHOLD = 3,000 ppm.**
- The odor threshold only serves as a warning of exposure. Not smelling it does not mean you are not being exposed.

#### WORKPLACE EXPOSURE LIMITS

**OSHA:** The legal airborne permissible exposure limit (PEL) is 1.0 ppm averaged over an 8 hour workshift and 5.0 ppm, not to be exceeded during any 15 minute work period.

**NIOSH:** Lowest reliably detectable level.

**ACGIH:** The recommended airborne exposure limit is 5.0 ppm averaged over an 8 hour workshift.

- Vinyl Chloride is a **CARCINOGEN** in humans. There may be no safe level of exposure to a carcinogen, so all contact should be reduced to the lowest possible level.

#### WAYS OF REDUCING EXPOSURE

- A regulated, marked area should be established where Vinyl Chloride is handled, used, or stored.
- Wash thoroughly immediately after exposure to Vinyl Chloride and at the end of the workshift.
- Wear protective work clothing.

This Fact Sheet is a summary source of information for workers, employers and community residents. Health professionals may also find it useful. If this substance is part of a mixture, this Fact Sheet should be used along with the manufacturer supplied Material Safety Data Sheet (MSDS).

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## HEALTH HAZARD INFORMATION

### Acute Health Effects

The following acute (short term) health effects may occur immediately or shortly after exposure to Vinyl Chloride:

- High exposure can cause you to feel dizzy, lightheaded, "high" and sleepy. Even higher levels can cause headaches, nausea, weakness, and can cause you to pass out and die.
- Contact can irritate the skin and eyes. The liquid can cause frostbite.

### Chronic Health Effects

The following chronic (long term) health effects can occur at some time after exposure to Vinyl Chloride and can last for months or years:

#### Cancer Hazard

- Vinyl Chloride is a CARCINOGEN in humans. It has been shown to cause liver, brain and lung cancer.
- Many scientists believe there is no safe level of exposure to a carcinogen. Such substances may also have the potential for causing reproductive damage in humans.

#### Reproductive Hazard

- Vinyl Chloride may damage the developing fetus and there is limited evidence that Vinyl Chloride is a teratogen in animals. Until further testing has been done, it should be treated as a possible teratogen in humans.
- An excess of spontaneous abortions has been reported among spouses of workers who had been exposed to Vinyl Chloride.
- Increased rates of birth defects have been reported in areas where Vinyl Chloride processing plants are located. Vinyl Chloride's role in this increased risk is unknown at this time.

#### Other Long Term Effects

- Repeated exposure can cause a disease called "scleroderma". This causes the skin to become very smooth, tight and shiny. It causes the bones of the fingers to erode ("acroosteolysis"), and damages the blood vessels in the hands ("Raynaud's syndrome"). This causes the hands (or feet) to turn numb, pale or blue with even mild cold exposure.
- Repeated exposure can permanently damage the liver and damage the kidneys, nervous system and blood cells.
- Vinyl Chloride can cause symptoms like stomach ulcers.
- Vinyl Chloride may cause a skin allergy. If allergy develops, very low future exposures can cause itching and a skin rash.

## MEDICAL TESTING

OSHA requires that your employer provide all exposed workers with the following before starting work and every year after that (every six months for those on the job more than 10 years):

- Complete liver function tests.

In addition the following may be useful:

- Kidney function tests.
- Complete blood count.
- Complete exam of the skin and nervous system.

If symptoms develop or overexposure is suspected, the following may be useful:

- x rays of the fingers.
- A test called "Urinary Thioglycolic acid level" (normal is usually less than 2 mg/liter).
- Evaluation by a qualified allergist, including careful exposure history and special testing, may help diagnose skin allergy.

Any evaluation should include a careful history of past and present symptoms with an exam. Medical tests that look for damage already done are not a substitute for controlling exposure. Request copies of your medical testing. You have a legal right to this information under OSHA 1910.20.

#### WORKPLACE CONTROLS AND PRACTICES

Unless a less toxic chemical can be substituted for a hazardous substance, ENGINEERING CONTROLS are the most effective way of reducing exposure. The best protection is to enclose operations and/or provide local exhaust ventilation at the site of chemical release. Isolating operations can also reduce exposure. Using respirators or protective equipment is less effective than the controls mentioned above, but is sometimes necessary.

In evaluating the controls present in your workplace, consider: (1) how hazardous the substance is, (2) how much of the substance is released into the workplace and (3) whether harmful skin or eye contact could occur. Special controls should be in place for highly toxic chemicals or when significant skin, eye, or breathing exposures are possible.

In addition, the following controls are recommended:

- Where possible, automatically pump liquid Vinyl Chloride from drums or other storage containers to process containers.
- Specific engineering controls are required for this chemical by OSHA. Refer to the OSHA standard: 1910.1017 Vinyl Chloride.
- Specific engineering controls are recommended for this chemical by NIOSH. Refer to the NIOSH Current Intelligence Bulletin: #79 146 Vinyl Halides Carcinogenicity # 28.
- Before entering a confined space where Vinyl Chloride may be present, check to make sure that an explosive concentration does not exist.

Good WORK PRACTICES can help to reduce hazardous exposures. The following work practices are recommended:

- Workers whose clothing has been contaminated by Vinyl Chloride should change into clean clothing promptly.
- Do not take contaminated work clothes home. Family members could be exposed.
- Contaminated work clothes should be laundered by individuals who have been informed of the hazards of exposure to Vinyl Chloride.
- If there is the possibility of skin exposure, emergency shower facilities should be provided.
- On skin contact with Vinyl Chloride, immediately wash or

shower to remove the chemical. At the end of the work shift, wash any areas of the body that may have contacted Vinyl Chloride, whether or not known skin contact has occurred.

- Do not eat, smoke, or drink where Vinyl Chloride is handled, processed, or stored, since the chemical can be swallowed. Wash hands carefully before eating or smoking.

#### PERSONAL PROTECTIVE EQUIPMENT

##### WORKPLACE CONTROLS ARE BETTER THAN PERSONAL PROTECTIVE EQUIPMENT.

However, for some jobs (such as outside work, confined space entry, jobs done only once in a while, or jobs done while workplace controls are being installed), personal protective equipment may be appropriate.

The following recommendations are only guidelines and may not apply to every situation.

##### Clothing

- Avoid skin contact with Vinyl Chloride. Wear solvent resistant gloves and clothing. Safety equipment suppliers/ manufacturers can provide recommendations on the most protective glove/ clothing material for your operation.
- All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day and put on before work.

##### Eye Protection

- Eye protection is included in the recommended respiratory protection.

##### Respiratory Protection

IMPROPER USE OF RESPIRATORS IS DANGEROUS. Such equipment should only be used if the employer has a written program that takes into account workplace conditions, requirements for worker training, respirator fit testing and medical exams, as described in OSHA 1910.134.

- At any exposure level, use a MSHA/NIOSH approved supplied air respirator with a full facepiece operated in the positive pressure mode or with a full facepiece, hood, or helmet in the continuous flow mode, or use a MSHA/NIOSH approved self contained breathing apparatus with a full facepiece operated in pressure demand or other positive pressure mode.

#### HANDLING AND STORAGE

- Prior to working with Vinyl Chloride you should be trained on its proper handling and storage.
- Vinyl Chloride must be stored to avoid contact with OXIDIZERS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES and NITRATES) since violent reactions occur.
- Sources of ignition, such as smoking and open flames, are prohibited where Vinyl Chloride is handled, used, or stored.
- Metal containers involving the transfer of 5 gallons or more of Vinyl Chloride should be grounded and bonded. Drums must be equipped with self closing valves, pressure vacuum bungs, and flame arresters.
- Use only non sparking tools and equipment, especially when opening and closing containers of Vinyl Chloride.
- Wherever Vinyl Chloride is used, handled, manufactured, or stored, use explosion proof electrical equipment and fittings.
- A regulated, marked area should be established where Vinyl Chloride is handled, used, or stored.

Common Name: Vinyl Chloride  
DOT Number: UN 1086  
DOT Emergency Guide code: 17  
CAS Number: 75-01-4

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NJ DOH Hazard rating  
FLAMMABILITY 4  
REACTIVITY 1

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FLAMMABLE GAS  
CARCINOGEN  
POISONOUS GAS IS PRODUCED IN FIRE  
CONTAINERS MAY EXPLODE IN FIRE

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Hazard Rating Key: 0=minimal; 1=slight; 2=moderate; 3=serious;  
4=severe

#### FIRE HAZARDS

- Vinyl Chloride is a FLAMMABLE GAS.
- Use dry chemical or CO2 extinguishers.
- POISONOUS GASES ARE PRODUCED IN FIRE, including Phosgene, Hydrogen Chloride, and Carbon Monoxide.
- CONTAINERS MAY EXPLODE IN FIRE.
- FIRE MAY RESTART AFTER IT HAS BEEN EXTINGUISHED.
- Vapors may travel to a source of ignition and flash back.
- If employees are expected to fight fires, they must be trained and equipped as stated in OSHA 1910.156.

#### SPILLS AND EMERGENCIES

If Vinyl Chloride is leaked, take the following steps:

- Restrict persons not wearing protective equipment from area of leak until cleanup is complete.
- Remove all ignition sources.
- Ventilate area of leak to disperse the gas.
- Stop flow of gas. If source of leak is a cylinder and the leak cannot be stopped in place, remove the leaking cylinder to a safe place in the open air, and repair leak or allow cylinder to empty.
- Keep Vinyl Chloride out of a confined space, such as a sewer, because of the possibility of an explosion, unless the sewer is designed to prevent the buildup of explosive concentrations.
- It may be necessary to contain and dispose of Vinyl Chloride as a HAZARDOUS WASTE. Contact state Environmental Program for specific recommendations.

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FOR LARGE SPILLS AND FIRES immediately call your fire department.

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#### FIRST AID

##### POISON INFORMATION

###### Eye Contact

- Immediately flush with large amounts of water for at least 15 minutes, occasionally lifting upper and lower lids. Seek medical attention immediately.

###### Skin Contact

- Immerse affected part in warm water. Seek medical attention.

#### Breathing

- Remove the person from exposure.
- Begin rescue breathing if breathing has stopped and CPR if heart action has stopped.
- Transfer promptly to a medical facility.

#### PHYSICAL DATA

Vapor Pressure: 2580 mm Hg at 68oF  
Flash Point: 108oF  
Water Solubility: Slightly soluble

#### OTHER COMMONLY USED NAMES

Chemical Name:  
Ethene, Chloro

Other Names and Formulations:  
Chloroethylene; VC; VCM; Vinyl Monomer; Chloroethene; Chloroethylene.

Not intended to be copied and sold for commercial purposes.

#### NEW JERSEY DEPARTMENT OF HEALTH

Right to Know Program  
CN 368, Trenton, NJ 08625 0368

#### ECOLOGICAL INFORMATION

Vinyl chloride is a highly flammable chemical which exists as a gas at room temperature. It is used to make polyvinyl chloride (PVC) which in turn is widely used to make plastics. It may enter the environment through industrial effluents or spills.

#### ACUTE (SHORT-TERM) ECOLOGICAL EFFECTS

Acute toxic effects may include the death of animals, birds, or fish, and death or low growth rate in plants. Acute effects are seen two to four days after animals or plants come in contact with a toxic chemical substance.

Data are insufficient to determine if vinyl chloride poses any acute toxicity hazards to aquatic life. No data are available on the short-term effects of vinyl chloride on plant, birds, or land animals.

#### CHRONIC (LONG-TERM) ECOLOGICAL EFFECTS

Chronic toxic effects may include shortened lifespan, reproductive problems, lower fertility, and changes in appearance or behavior. Chronic effects can be seen long after first exposure(s) to a toxic chemical.

Data are insufficient to determine if vinyl chloride poses any chronic toxicity hazards to aquatic life. No data are available on the long-term effects of vinyl chloride on plant, birds, or land animals.

#### WATER SOLUBILITY

Vinyl chloride is moderately soluble in water. Concentrations of between 1 to 1,000 milligrams will mix with a liter of water.

#### DISTRIBUTION AND PERSISTENCE IN THE ENVIRONMENT

Vinyl Chloride is non-persistent in water. The half-life of a pollutant is the amount of time it takes for one-half of the chemical to be degraded. About 99.9% of vinyl chloride will eventually end up in air.

#### BIOACCUMULATION IN AQUATIC ORGANISMS

Some substances increase in concentration, or bioaccumulate, in living organisms as they breathe contaminated air, drink contaminated water, or eat contaminated food. These chemicals can become concentrated in the tissues and internal organs of animals and humans.

The concentration of vinyl chloride found in fish tissues is expected to be about the same as the average concentration of vinyl chloride in the water from which the fish was taken.

SUPPORT DOCUMENT: AQUIRE Database, ERL-Duluth, U.S. EPA.



CHEM SERVICE -- 0-780, M-XYLENE 1,3-DIMETHYLBENZENE-1,3-XYL  
MATERIAL SAFETY DATA SHEET  
NSN: 681000N033512  
Manufacturer's CAGE: 8Y898  
Part No Indicator: A  
Part Number/Trade Name: 0-780, M-XYLENE 1,3-DIMETHYLBENZENE/1,3-XYL

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General Information

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Company's Name: CHEM SERVICE INC  
Company's P. O. Box: 3108  
Company's City: WEST CHESTER  
Company's State: PA  
Company's Country: US  
Company's Zip Code: 19381  
Company's Emerg Ph #: 215-692-3026  
Company's Info Ph #: 215-692-3026  
Record No For Safety Entry: 001  
Tot Safety Entries This Stk#: 001  
Status: SMJ  
Date MSDS Prepared: 27JUN91  
Safety Data Review Date: 18AUG92  
MSDS Serial Number: BPQJX  
Hazard Characteristic Code: NK

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Ingredients/Identity Information

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Proprietary: NO  
Ingredient: M-XYLENE;(1,3 DIMETHYLBENZENE/1,3-XYLENE)  
Ingredient Sequence Number: 01  
NIOSH (RTECS) Number: ZE2275000  
CAS Number: 108-38-3  
OSHA PEL: 100 PPM/150 STEL  
ACGIH TLV: 100 PPM/150 STEL

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Physical/Chemical Characteristics

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Appearance And Odor: COLORLESS LIQUID WITH AN AROMATIC ODOR  
Boiling Point: 280F,138C  
Vapor Pressure (MM Hg/70 F): 9 @20C  
Vapor Density (Air=1): 3.7  
Specific Gravity: 0.868  
Solubility In Water: INSOLUBLE

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Fire and Explosion Hazard Data

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Flash Point: 77.0F,25.0C  
Lower Explosive Limit: 1.1%  
Upper Explosive Limit: 7%  
Extinguishing Media: CARBON DIOXIDE, DRY CHEMICAL POWDER OR SPRAY.  
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).  
Unusual Fire And Expl Hazrds: VAPORS MAY TRAVEL ALONG CONSIDERABLE DISTANCE TO SOURCE OF IGNITION AND FLASH BACK. CONTAINER MAY EXPLODE UNDER FIRE CNDTNS. FORMS EXPLOSIVE MIXTURE IN AIR.

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Reactivity Data

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Stability: YES  
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.  
Materials To Avoid: STRONG OXIDIZING AGENTS.  
Hazardous Decomp Products: TOXIC FUMES.  
Hazardous Poly Occur: NO  
Conditions To Avoid (Poly): NOT RELEVANT.

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#### Health Hazard Data

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LD50-LC50 Mixture: LD50:(ORAL RAT)5000 MG/KG.

Route Of Entry - Inhalation: YES

Route Of Entry - Skin: YES

Route Of Entry - Ingestion: YES

Health Haz Acute And Chronic: CAN CAUSE ADVERSE REPRODUCTIVE EFFECTS. MAY BE HARMFUL IF ABSORBED THROUGH SKIN. MAY BE HARMFUL IF INHALED. CAN CAUSE SKIN IRRITATION. CAN CAUSE EYE IRRITATION. MAY BE HARMFUL IF SWALLOWED. CAN BE IRRITATING TO MUCOUS MEMBRANES. PROLONGED EXPOSURE MAY CAUSE NAUS, HDCH, DIZZ, AND/OR EYE DAMAGE.(EFTS OF OVEREXP)

Carcinogenicity - NTP: NO

Carcinogenicity - IARC: NO

Carcinogenicity - OSHA: NO

Explanation Carcinogenicity: NOT RELEVANT.

Signs/Symptoms Of Overexp: HLTH HAZ:CAN CAUSE GI DISTURBANCES. NARCOTIC AT HIGH CONC. INGEST MAY CAUSE SEVERE CORROSION OF MOUTH. CAN CAUSE NERV SYS INJURY. EXPOS CAN CAUSE LIVER & KIDNEY DMG. CAN CAUSE BLOOD DISORDERS. HIGH CONC EXTREMELY DESTRUCTIVE TO TISS OF MUC MEMB & UPPER RESP TRACT, EYES, & SKIN. SYMPS OF OVEREXP INCL:BURNING (SUPP DATA)

Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.

Emergency/First Aid Proc: EYE:FLUSH CONTINUOUSLY W/WATER FOR 15-20 MINUTES. SKIN:FLUSH WITH WATER FOR 15-20 MINUTES. IF NO BURNS HAVE OCCURED, USE SOAP & WATER TO CLEANSE SKIN. INHAL:MOVE TO FRESH AIR. GIVE OXYGEN IF BREATHING DIFFICULT. IF BREATHING STOPPED, GIVE ARTIFICIAL RESPIRATION. IF PATIENT IS IN CARDIAC ARREST GIVE CPR. CONTINUE LIFE SUPPORTING MEASURES UNTIL MD HAS ARRIVED.

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#### Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROPRIATE OSHA REGULATED EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE OR SIMILAR MATERIAL. SWEEP UP AND PLACE IN AN APPROPRIATE CONTAINER. HOLD FOR DISPOSAL. WASH CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.

Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.

Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER. DISPOSAL MUST BE I/A/W FEDERAL, STATE AND LOCAL REGULATIONS (FP N).

Precautions-Handling/Storing: KEEP TIGHTLY CLOSED IN COOL DRY PLACE. STORE ONLY WITH COMPATIBLE MATERIALS. THIS CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.

Other Precautions: AVOID CONTACT WITH SKIN, EYES AND CLOTHING. AVOID DIRECT PHYSICAL CONTACT. THIS PRODUCT FOR LABORATORY USE ONLY.

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#### Control Measures

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Respiratory Protection: NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N).

Ventilation: THIS CHEMICAL SHOULD BE HANDLED ONLY IN A FUME HOOD.

Protective Gloves: IMPERVIOUS GLOVES.

Eye Protection: CHEMICAL WORKERS GOGGLES (FP N).

Other Protective Equipment: NONE SPECIFIED BY MANUFACTURER.

Work Hygienic Practices: CONTACT LENSES SHOULD NOT BE WORN.

Suppl. Safety & Health Data: EFTS OF OVEREXP:SENSATION, COUGHING, WHEEZING, LARYNGITIS, SHORTNESS OF BREATH, HDCH, NAUS &/OR VOMIT. PROLONGED EXPOS CAN CAUSE LUNG IRRITATION, CHEST PAIN AND EDEMA WHICH MAY BE FATAL. EXPOS CAN CAUSE CNS DEPRESSION. CAN CAUSE DERMATITIS. EXPOS CAN CAUSE STOMACH PAINS, VOMITING & DIARRHEA. CAN CASUE GI DISTURBANCES.

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#### Transportation Data

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Trans Data Review Date: 93019

DOT PSN Code: GJL

DOT Proper Shipping Name: FLAMMABLE LIQUIDS, N.O.S.

DOT Class: 3  
DOT ID Number: UN1993  
DOT Pack Group: III  
DOT Label: FLAMMABLE LIQUID  
IMO PSN Code: H1A  
IMO Proper Shipping Name: FLAMMABLE LIQUID, N.O.S.  
IMO Regulations Page Number: 3345  
IMO UN Number: 1993  
IMO UN Class: 3.3  
IATA PSN Code: MCA  
IATA UN ID Number: 1993  
IATA Proper Shipping Name: FLAMMABLE LIQUID, N.O.S. \*  
IATA UN Class: 3  
IATA Label: FLAMMABLE LIQUID  
AFI PSN Code: MCA  
AFI Prop. Shipping Name: FLAMMABLE LIQUIDS, N.O.S.  
AFI Class: 3  
AFI ID Number: UN1993  
AFI Pack Group: III  
AFI Label: FLAMMABLE LIQUID  
AFI Basic Pac Ref: 7-7

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Disposal Data

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Label Data

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Label Required: YES  
Technical Review Date: 12AUG92  
Label Date: 12AUG92  
Label Status: G  
Common Name: 0-780, M-XYLENE 1,3-DIMETHYLBENZENE/1,3-XYLENE  
Chronic Hazard: YES  
Signal Word: DANGER!  
Acute Health Hazard-Moderate: X  
Contact Hazard-Moderate: X  
Fire Hazard-Severe: X  
Reactivity Hazard-None: X  
Special Hazard Precautions: FLAMMABLE. KEEP AWAY FROM HEAT, SPARKS, OPEN FLAME, STRONG OXIDIZERS. VAPORS MAY TRAVEL TO SOURCE OF IGNITION AND FLASH BACK. ACUTE CAN CAUSE SEVERE SKIN AND EYE IRRITATION. MAY BE HARMFUL IF ABSORBED THROUGH SKIN. MAY BE HARMFUL IF INGESTED. CAUSES GASTROINTESTINAL DISTURBANCES AND SEVERE CORROSION OF THE MOUTH. CAN BE IRRITATING TO MUCOUS MEMBRANES. MAY BE HARMFUL IF INHALED. NARCOTIC AT HIGH CONCENTRATIONS. CAN CAUSE CNS DEPRESSION, NAUSEA, HEADACHE, COUGHING, WHEEZING. CHRONIC: CAN CAUSE LIVER AND KIDNEY DAMAGE, ADVERSE REPRODUCTIVE EFFECTS, BLOOD DISORDERS, AND NERVOUS SYSTEM DAMAGE.  
Protect Eye: Y  
Protect Skin: Y  
Protect Respiratory: Y  
Label Name: CHEM SERVICE INC  
Label P.O. Box: 3108  
Label City: WEST CHESTER  
Label State: PA  
Label Zip Code: 19381  
Label Country: US  
Label Emergency Number: 215-692-3026

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URL for this msds <http://siri.org>. If you wish to change, add to, or delete information in this archive please send updates to [dan@siri.org](mailto:dan@siri.org).

CHEM SERVICE - O-XYLENE, F719  
MATERIAL SAFETY DATA SHEET  
NSN: 681000N052456  
Manufacturer's CAGE: 8Y898  
Part No. Indicator: A  
Part Number/Trade Name: O-XYLENE, F719

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General Information

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Company's Name: CHEM SERVICE INC  
Company's P. O. Box: 3108  
Company's City: WEST CHESTER  
Company's State: PA  
Company's Country: US  
Company's Zip Code: 19381  
Company's Emerg Ph #: 215-692-3026  
Company's Info Ph #: 215-692-3026  
Record No. For Safety Entry: 001  
Tot Safety Entries This Stk#: 001  
Status: SMJ  
Date MSDS Prepared: 01DEC90  
Safety Data Review Date: 30AUG94  
MSDS Serial Number: BVMHR  
Hazard Characteristic Code: NK

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Ingredients/Identity Information

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Proprietary: NO  
Ingredient: O-XYLENE (SARA III)  
Ingredient Sequence Number: 01  
NIOSH (RTECS) Number: ZE2450000  
CAS Number: 95-47-6  
OSHA PEL: 100 PPM  
ACGIH TLV: 100 PPM; 150 STEL

Proprietary: NO  
Ingredient: SUPP DATA: AN ANTIDOTE IS A SUBSTANCE INTENDED TO COUNTERACT  
EFT OF A POIS. IT SHOULD BE ADMIN ONLY BY MD/TRAINED (ING 3)  
Ingredient Sequence Number: 02  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

Proprietary: NO  
Ingredient: ING 2: EMERGENCY PERSONNEL. MEDICAL ADVICE CAN BE OBTAINED FROM  
A POISON CONTROL CENTER.  
Ingredient Sequence Number: 03  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

Proprietary: NO  
Ingredient: EYE PROT: & FULL LENGTH FACE SHIELD (FP N).  
Ingredient Sequence Number: 04  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

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Physical/Chemical Characteristics

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Appearance And Odor: COLORLESS LIQUID; AROMATIC ODOR.  
Boiling Point: >289F, >143C  
Melting Point: 77.0F, 25.0C  
Vapor Pressure (MM Hg/70 F): 7 @ 20C

Specific Gravity: 0.8801  
Solubility In Water: INSOLUBLE

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Fire and Explosion Hazard Data

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Flash Point: 62.6F, 17.0C  
Lower Explosive Limit: 1%  
Upper Explosive Limit: 6%  
Extinguishing Media: CARBON DIOXIDE OR DRY CHEMICAL POWDER. DO NOT USE WATER!  
Special Fire Fighting Proc: USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).  
Unusual Fire And Expl Hazrds: THIS IS A FLAMMABLE CHEMICAL.

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Reactivity Data

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Stability YES  
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.  
Materials To Avoid: INCOMPATIBLE W/STRONG OXIDIZING AGENTS.  
Hazardous Decomp Products: DECOMPOSITION LIBERATES TOXIC FUMES.  
DECOMPOSITION PRODUCTS ARE CORROSIVE.  
Hazardous Poly Occur: NO  
Conditions To Avoid (Poly): NOT RELEVANT

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Health Hazard Data

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LD50-LC50 Mixture: LD50:(ORAL,RAT) 5000 MG/KG.  
Route Of Entry - Inhalation: YES  
Route Of Entry - Skin: YES  
Route Of Entry - Ingestion: YES  
Health Haz Acute And Chronic: MAY BE HARMFUL IF ABSORBED THROUGH SKIN, INHALED OR SWALLOWED. CAN CAUSE SKIN/EYE IRRITATION. CAN BE IRRITATING TO MUCOUS MEMBRANES. PROLONGED EXPOSURE MAY CAUSE NAUSEA, HEADACHE, DIZZINESS &/OR EYE DAMAGE. CAN CAUSE GASTRO-INTESTINAL DISTURBANCES. NARCOTIC AT HIGH CONCENTRATIONS. CHRONIC EXPOSURE MAY (EFTS OF OVEREXP)  
Carcinogenicity - NTP: NO  
Carcinogenicity - IARC: NO  
Carcinogenicity - OSHA: NO  
Explanation Carcinogenicity: NOT RELEVANT  
Signs/Symptoms Of Overexp: HLTH HAZ:CAUSE BRONCHITIS. CAN CAUSE NERVOUS SYSTEM INJURY. EXPOSURE CAN CAUSE KIDNEY DAMAGE. CAN CAUSE BLOOD DISORDERS.  
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.  
Emergency/First Aid Proc: EYES:FLUSH CONTINUOUSLY W/WATER FOR AT LST 15-20 MINS. SKIN:FLUSH W/WATER FOR 15-20 MINS. IF NOT BURNS HAVE OCCURRED- USE SOAP & WATER TO CLEANSE SKIN. REMOVE & WASH CONTAM CLTHG. INHAL:REMOVE PATIENT TO FRESH AIR. ADMIN OXYGEN IF PATIENT IS HAVING DIFFCLTY BRTHG. IF PATIENT HAS STOPPED BRTHG ADMIN ARTF RESP. IF PATIENT IS IN CARDIAC ARREST ADMIN CPR. CONTINUE LIFE SUPPORTING MEASURES UNTIL (SUPDAT)

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Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROPRIATE NIOSH/MSHA APPROVED NIOSH/MSHA APPROVED REGULATED EQUIP. VENTILATE AREA ABSORB ON VERMICULITE OR SIMILAR MATL. SWEEP UP & PLACE IN APPROPRIATE CONTAINER. HOLD FOR DISPOSAL. WASH CONTAM SURFACES TO REMOVE ANY RESIDUES.  
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.  
Waste Disposal Method: DISPOSAL MUST BE I/A/W FEDERAL, STATE & LOCAL REGULATIONS (FP N). BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AFTERBURNER & SCRUBBER.  
Precautions-Handling/Storing: FLAMMABLE. AVOID CONTACT W/SKIN, EYES & CLOTHING. KEEP TIGHTLY CLOSED IN A COOL, DRY PLACE. STORE ONLY W/COMPATIBLE CHEMICALS.  
Other Precautions: ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS - AVOID DIRECT PHYSICAL CONTACT! THIS PRODUCT IS FURNISHED FOR LAB USE ONLY! OUR

PRODS MAY NOT BE USED AS DRUGS, COSMETICS, AGRICULTURAL OR PESTICIDAL  
PRODS, FOOD ADDITIVES/AS HOUSEHOLD CHEMS.

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Control Measures

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Respiratory Protection: NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR  
EXPOSURE OF CONCERN (FP N).

Ventilation: THIS CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.

Protective Gloves: IMPERVIOUS GLOVES (FP N).

Eye Protection: ANSI APPROVED CHEM WORKERS GOGGS (ING 4)

Other Protective Equipment: EMERGENCY EYE WASH & DELUGE SHOWER WHICH MEET  
ANSI DESIGN CRITERIA (FP N). USE APPROPRIATE NIOSH/MSHA APPRVD SFTY EQUIP.

Work Hygienic Practices: CONTACT LENSES SHOULD NOT BE WORN IN THE LABORATORY.

Suppl. Safety & Health Data: FIRST AID PROC: MED ASSISTANCE HAS ARRIVED. IF

PATIENT IS EXHIBITING SIGNS OF SHOCK - KEEP WARM & QUIET. INGEST: CONT POIS  
CTL CTR IMMED IF NEC. DO NOT ADMIN LIQS/INDUCE VOMIT TO UNCONV/ CONVULSING  
PERS. IF PATIENT IS VOMIT-WATCH CLOSELY TO MAKE SURE AIRWAY DOES NOT BECOME  
OBSTRUCTED BY VOMIT. GET MED ATTN IF NEC. (ING 2)

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Transportation Data

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Disposal Data

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Label Data

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Label Required: YES

Technical Review Date: 30AUG94

Label Date: 26AUG94

Label Status: G

Common Name: O-XYLENE, F719

Chronic Hazard: YES

Signal Word: DANGER!

Acute Health Hazard-Moderate: X

Contact Hazard-Slight: X

Fire Hazard-Severe: X

Reactivity Hazard-None: X

Special Hazard Precautions: FLAMMABLE. ACUTE: MAY BE HARMFUL IF ABSORBED  
THROUGH SKIN, INHALED OR SWALLOWED. CAN CAUSE SKIN/EYE IRRITATION. CAN BE  
IRRITATING TO MUCOUS MEMBRANES. PROLONGED EXPOSURE MAY CAUSE NAUSEA,  
HEADACHE, DIZZINESS &/OR EYE DAMAGE. CAN CAUSE GASTRO-INTESTINAL  
DISTURBANCES. NARCOTIC AT HIGH CONCENTRATIONS. CHRONIC: EXPOSURE MAY CAUSE  
BRONCHITIS. CAN CAUSE NERVOUS SYSTEM INJURY. EXPOSURE CAN CAUSE KIDNEY  
DAMAGE. CAN CAUSE BLOOD DISORDERS.

Protect Eye: Y

Protect Skin: Y

Protect Respiratory: Y

Label Name: CHEM SERVICE INC

Label P.O. Box: 3108

Label City: WEST CHESTER

Label State: PA

Label Zip Code: 19381

Label Country: US

Label Emergency Number: 215-692-3026

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URL for this data: <http://siri.org>. If you wish to change, add to, or  
delete information in this archive please send updates to [dan@siri.org](mailto:dan@siri.org).

**APPENDIX F.2**  
**MSDS - ACIDS AND BASES**

## **APPENDIX F.2**

### **MSDS - ACIDS AND BASES**

The following MSDS sheets are included in alphabetical order for acids and bases that may be used during the field effort:

- Hydrochloric Acid                      pg. F.2. 2-5
- Nitric Acid                                pg. F.2. 6-10
- Sodium Hydroxide                      pg. F.2. 11-14
- Sulfuric Acid,                            pg. F.2. 15-17



FISHER SCIENTIFIC CHEMICAL DIV -- HYDROCHLORIC ACID,MURIATIC ACID,A-144 - HYDROCHLORIC ACID,ACS

## MATERIAL SAFETY DATA SHEET

NSN: 6810011458100

Manufacturer's CAGE: 1B464

Part No. Indicator: A

Part Number/Trade Name: HYDROCHLORIC ACID,MURIATIC ACID,A-144

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General Information

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Item Name: HYDROCHLORIC ACID,ACS  
Company's Name: FISHER SCIENTIFIC, CHEMICAL DIV.  
Company's Street: 1 REAGENT LANE  
Company's City: FAIR LAWN  
Company's State: NJ  
Company's Country: US  
Company's Zip Code: 07410  
Company's Emerg Ph #: 201-796-7100 OR 201-796-7523  
Company's Info Ph #: 201-796-7100  
Record No. For Safety Entry: 001  
Tot Safety Entries This Stk#: 007  
Status: SE  
Date MSDS Prepared: 10MAY91  
Safety Data Review Date: 23DEC91  
Supply Item Manager: CX  
MSDS Serial Number: BLMWK  
Specification Number: O-C-265  
Hazard Characteristic Code: C1  
Unit Of Issue: DR  
Unit Of Issue Container Qty: 6.500 GALLONS  
Type Of Container: DRUM  
Net Unit Weight: 65.0 LBS

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Ingredients/Identity Information

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Proprietary: NO  
Ingredient: HYDROGEN CHLORIDE (HYDROCHLORIC ACID) (SARA III)  
Ingredient Sequence Number: 01  
Percent: 37  
NIOSH (RTECS) Number: MW4025000  
CAS Number: 7647-01-0  
OSHA PEL: C 5 PPM  
ACGIH TLV: C 5 PPM, 9192  
Other Recommended Limit: NONE SPECIFIED

Proprietary: NO  
Ingredient: WATER  
Ingredient Sequence Number: 02  
Percent: 63  
NIOSH (RTECS) Number: ZC0110000  
CAS Number: 7732-18-5  
OSHA PEL: NOT RELEVANT  
ACGIH TLV: NOT RELEVANT  
Other Recommended Limit: NONE SPECIFIED

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Physical/Chemical Characteristics

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Appearance And Odor: COLORLESS TO YELLOW LIQUID WITH A PUNGENT, IRRITATING ODOR.  
Boiling Point: UNKNOWN  
Melting Point: UNKNOWN  
Vapor Pressure (MM Hg/70 F): UNKNOWN  
Vapor Density (Air=1): 1.3  
Specific Gravity: 1.2  
Decomposition Temperature: UNKNOWN  
Evaporation Rate And Ref: UNKNOWN

Solubility In Water: COMPLETE  
Viscosity: UNKNOWN  
pH: 1.1  
Corrosion Rate (IPY): UNKNOWN

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Fire and Explosion Hazard Data

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Flash Point: NONE  
Extinguishing Media: USE WATER FOG, CARBON DIOXIDE, FOAM, OR DRY CHEMICAL FOR SURROUNDING FIRE. DO NOT PUT WATER INTO THE ACID TANK.  
Special Fire Fighting Proc: WEAR A FULL FACE SELF-CONTAINED BREATHING APPARATUS AND IMPERVIOUS CLOTHING. PREVENT HUMAN EXPOSURE TO FIRE, FUMES, PRODUCTS OF COMBUSTION.  
Unusual Fire And Expl Hazrds: EXCESSIVE HEAT MAY CAUSE THE TANK TO RUPTURE. TAKE CARE NOT TO IGNITE HYDROGEN GAS WHICH CAN ACCUMULATE INSIDE METAL TANKS CONTAINING HYDROCHLORIC ACID.

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Reactivity Data

=====

Stability: YES  
Cond To Avoid (Stability): STABLE AT NORMAL AMBIENT TEMPERATURES AND ATMOSPHERIC PRESSURE. RELEASES HYDROGEN CHLORIDE GAS WHEN HEATED.  
Materials To Avoid: ACETIC ANHYDRIDE,ALCOHOLIC HYDROGEN CYANIDE,AL,2-AMINOETHANOL,NH4OH,BASES,WATER,BRASS,STRONG OXIDIZERS,METALS,FLUORINE  
Hazardous Decomp Products: WITH METALS GIVES HYDROGEN GAS,WHICH WHEN MIXED WITH AIR,MAY RESULT IN EXPLOSION OR FIRE.WITH OXIDIZER GIVES OFF CL2.  
Hazardous Poly Occur: NO  
Conditions To Avoid (Poly): NONE

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Health Hazard Data

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LD50-LCSO Mixture: LC50 INHALATION-RAT 4701 PPM/30 MINUTES  
Route Of Entry - Inhalation: YES  
Route Of Entry - Skin: YES  
Route Of Entry - Ingestion: YES  
Health Haz,Acute And Chronic: ACUTE-INHALATION:MAY CAUSE IRRITATION, BURNING,COUGHING,CHOKING,HEADACHE,PULMONARY EDEMA,LIVER DAMAGE & DEATH. EYES CAN CAUSE SEVERE IRRITATION,BURNS,LOSS OF VISION.SKIN:SEVERE IRRITATION,NECROSIS & BURNS.INGESTION:MAY CAUSE SEVERE BURNS TO MOUTH, THROAT & STOMACH.DEATH MAY OCCUR.CHRONIC-BRONCHITIS,GASTRITIS,DERMATITIS  
Carcinogenicity - NTP: NO  
Carcinogenicity - IARC: NO  
Carcinogenicity - OSHA: NO  
Signs/Symptoms Of Overexp: INHALATION MAY CAUSE IRRITATION, BURNING, COUGHING, CHOKING, HEADACHE, PULMONARY EDEMA, LIVER DAMAGE & DEATH. CAN CAUSE SEVERE EYE IRRITATION, BURNS, LOSS OF VISION. MAY RESULT IN SEVERE IRRITATION, NECROSIS, ULCERATION & BURNS OF SKIN. INGESTION MAY CAUSE SEVERE BURNS TO MOUTH, THROAT & STOMACH. DEATH MAY OCCUR.  
Med Cond Aggravated By Exp: PRE-EXISTING SKIN DISORDERS  
IMMEDIATELY FLUSH WITH WATER FOR AT LEAST 15 MINUTES.KEEP EYELIDS OPEN. INHALATION REMOVE TO FRESH AIR.GIVE CPR/OXYGEN IF NECESSARY.INGESTION:DO NOT USE GASTRIC LAVAGE/EMESIS.IF CONSCIOUS,DRINK LARGE AMOUNT OF WATER/MILK. IF VOMITING OCCURS,DRINK FLUIDS REPEATEDLY.INGESTED ACID MUST BE DILUTED 100 FOLD TO RENDER IT HARMLESS TO TISSUE.TREAT SYMPTOMATICALLY

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Precautions for Safe Handling and Use

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Steps If Mat Released/Spill: WEAR PROPER PROTECTIVE EQUIPMENT EVACUATE AREA,KEEP UPWIND.WEAR SELF-CONTAINED BREATHING APPARATUS.DIKE LARGE SPILLS COVER SPILLS WITH SODIUM BICARBONATE,SODA ASH, OR LIME.AVOID FOAMING. TRANSFER TO DOT APPROVED CONTAINERS.IF SMALL SPILLS,USE SAND.  
Neutralizing Agent: SODA ASH, LIME, SODIUM BICARBONATE  
Waste Disposal Method: CONTACT FEDERAL, COUNTY, AND LOCAL ENVIRONMENTAL REGULATORS FOR GUIDANCE REGARDING PROPER DISPOSAL.  
Precautions-Handling Storing: STORAGE-STORE IN A COOL WELL VENTILATED PLACE AWAY FROM SUN & HEAT.STORE IN AN UPRIGHT POSITION.

Other Precautions: DANGER! CORROSIVE; BURNS EYES AND SKIN. HARMFUL IF SWALLOWED. DO NOT GET IN EYES, ON SKIN, OR ON CLOTHING. DO NOT BREATHE VAPORS. KEEP CONTAINER CLOSED. DO NOT TAKE INTERNALLY. ALWAYS POUR ACID INTO WATER. REPORTABLE QUANTITY IS 5000 POUNDS.

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**Control Measures**

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Respiratory Protection: USE NATIONAL INSTITUTE OF OCCUPATIONAL SAFETY AND HEALTH (NIOSH) OR MINE SAFETY AND HEALTH ADMINISTRATION (MSHA) APPROVED RESPIRATOR APPROPRIATE FOR THIS PRODUCT WHEN PERMISSIBLE EXPOSURE LIMITS ARE EXCEEDED.

Ventilation: PROVIDE GENERAL VENTILATION TO MEET OSHA PERMISSIBLE EXPOSURE LIMITS (OSHA PEL).

Protective Gloves: RUBBER OR NEOPRENE

Eye Protection: CHEMICAL SAFETY GOGGLES & FACE SHIELD

Other Protective Equipment: USE RUBBER SPLASH APRON AND RUBBER BOOTS.

EYEWASH AND SAFETY SHOWER SHOULD BE LOCATED NEARBY.

Work Hygienic Practices: WASH THOROUGHLY AFTER HANDLING.

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**Transportation Data**

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Trans Data Review Date: 91357

DOT PSN Code: HJG

DOT Proper Shipping Name: HYDROCHLORIC ACID, SOLUTION

DOT Class: 8

DOT ID Number: UN1789

DOT Pack Group: II

DOT Label: CORROSIVE

IMO PSN Code: IEX

IMO Proper Shipping Name: HYDROCHLORIC ACID, SOLUTION

IMO Regulations Page Number: 8183

IMO UN Number: 1789

IMO UN Class: 8

IMO Subsidiary Risk Label: -

IATA PSN Code: NPG

IATA UN ID Number: 1789

IATA Proper Shipping Name: HYDROCHLORIC ACID SOLUTION

IATA UN Class: 8

IATA Label: CORROSIVE

AFI PSN Code: NPG

AFI Symbols: T

AFI Prop. Shipping Name: HYDROCHLORIC ACID, SOLUTION

AFI Class: 8

AFI ID Number: UN1789

AFI Pack Group: II

AFI Label: CORROSIVE

AFI Special Prov: A3, A6, N41

AFI Basic Pac Ref: 12-5

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**Disposal Data**

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**Label Data**

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Label Required: YES

Technical Review Date: 23DEC91

MFR Label Number: UNKNOWN

Label Status: F

Common Name: HYDROCHLORIC ACID, MURIATIC ACID, A-144

Signal Word: DANGER!

Acute Health Hazard-Severe: X

Contact Hazard-Severe: X

Fire Hazard-None: X

Reactivity Hazard-Slight: X

Special Hazard Precautions: ACUTE-INHALATION: MAY CAUSE IRRITATION, BURNING, COUGHING, CHOKING, HEADACHE, PULMONARY EDEMA, LIVER DAMAGE & DEATH. EYES CAN

CAUSE SEVERE IRRITATION, BURNS, LOSS OF VISION. SKIN: SEVERE IRRITATION, NECROSIS & BURNS. INGESTION: MAY CAUSE SEVERE BURNS TO MOUTH, THROAT & STOMACH. DEATH MAY OCCUR. CHRONIC-BRONCHITIS, GASTRITIS, DERMATITIS. STORAGE: STORE IN A COOL WELL VENTILATED PLACE. FIRST AID-GET MEDICAL CARE IN ALL CASES. EYES/SKIN: IMMEDIATELY FLUSH WITH WATER FOR AT LEAST 15 MINUTES. KEEP EYELIDS OPEN. INHALATION: REMOVE TO FRESH AIR. GIVE CPR/OXYGEN IF NECESSARY. INGESTION: DO NOT USE GASTRIC LAVAGE/EMESIS. IF CONSCIOUS, DRINK WATER/MILK. ACID SHOULD BE DILUTED 100 FOLDS

Protect Eye: Y

Protect Skin: Y

Protect Respiratory: Y

Label Name: FISHER SCIENTIFIC, CHEMICAL DIV.

Label Street: 1 REAGENT LANE

Label City: FAIR LAWN

Label State: NJ

Label Zip Code: 07410

Label Country: US

Label Emergency Number: 201-796-7100 OR 201-796-7523

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URL for this msds <http://siri.org>. If you wish to change, add to, or delete information in this archive please send updates to [dan@siri.org](mailto:dan@siri.org).

FISHER SCIENTIFIC -- NITRIC ACID (A-200) - NITRIC ACID, ACS  
MATERIAL SAFETY DATA SHEET  
NSN: 6810007534779  
Manufacturer's CAGE: 94480  
Part No Indicator: A  
Part Number/Trade Name: NITRIC ACID (A-200)

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General Information

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Item Name: NITRIC ACID, ACS  
Company's Name: FISHER SCIENTIFIC  
Company's Street: 1 REAGENT LANE  
Company's City: FAIR LAWN  
Company's State: NJ  
Company's Country: US  
Company's Zip Code: 07410  
Company's Emerg Ph #: 201-796-7100;800-424-9300(CHEMTREC)  
Company's Info Ph #: 201-796-7100  
Record No. For Safety Entry: 002  
Tot Safety Entries This Stk#: 002  
Status: SMJ  
Date MSDS Prepared: 14DEC90  
Safety Data Review Date: 13FEB91  
Supply Item Manager: S9M  
MSDS Serial Number: BKLJY  
Hazard Characteristic Code: N/

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Ingredients/Identity Information

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Proprietary: NO  
Ingredient: NITRIC ACID (SARA III)  
Ingredient Sequence Number: 01  
Percent: 70  
NIOSH (RTECS) Number: QU5775000  
CAS Number: 7697-37-2  
OSHA PEL: 2 PPM/4 STEL  
ACGIH TLV: 2 PPM/4 STEL; 9192

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Proprietary: NO  
Ingredient: WATER  
Ingredient Sequence Number: 02  
Percent: 30  
NIOSH (RTECS) Number: ZC0110000  
CAS Number: 7732-18-5  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

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Proprietary: NO  
Ingredient: MATLS TO AVOID:OXIDIZERS. FOR MORE SPECIFIC INFORMATION  
CONTACT FOCAL POINT (FP N). HLTH HAZ:HEAL SLOWLY. (SEE ING 4)  
Ingredient Sequence Number: 03  
NIOSH (RTECS) Number: 9999999ZZ

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Proprietary: NO  
Ingredient: ING 3:(CHRONIC) DERMATITIS OR EFTS SIMILAR TO ACUTE EXPOS.  
EYE:(ACUTE) PAIN & BURNS, POSS SEVERE. CORNEA DMG (SEE IN 5)  
Ingredient Sequence Number: 04  
NIOSH (RTECS) Number: 9999999ZZ

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Proprietary: NO  
Ingredient: ING 4:& POSS BLINDNESS. EYE MAY BE TOTALLY DESTROYED. YELLOW  
DISCOLORATION. (CHRONIC) CONJUNCTIVITIS & EFTS (SEE ING 6)  
Ingredient Sequence Number: 05  
NIOSH (RTECS) Number: 9999999ZZ

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Proprietary: NO

Ingredient: ING 5:SIMILAR TO ACUTE EXPOS. INGEST:(ACUTE) BURNS/  
DISCOLORATION TO MOUTH, THROAT, ESOPHAGUS. EPIGLOTTAL (SEE ING 7)  
Ingredient Sequence Number: 06  
NIOSH (RTECS) Number: 9999999ZZ

Proprietary: NO  
Ingredient: ING 6 EDEMA WHICH MAY RESULT IN RESP DISTRESS & ASPHYXIA. PAIN  
& INABILITY TO SWALLOW OR SPEAK. EPIGASTRIC (SEE ING 8)  
Ingredient Sequence Number: 07  
NIOSH (RTECS) Number: 9999999ZZ

Proprietary: NO  
Ingredient: ING 7:PAIN, SHOCK W/MARKED HYPOTENSION. CIRCULATORY COLLAPSE  
MAY ENSUE & IF UNCORRECTED, LEAD TO RENAL (SEE ING 9)  
Ingredient Sequence Number: 08  
NIOSH (RTECS) Number: 9999999ZZ

Proprietary: NO  
Ingredient: ING 8:FAILURE. POSS ESOPHAGEAL & GASTRIC PERFORATION RESULTING  
IN PERITONITIS. GASTRIC & PYLORIC STRICTURE (SEE ING 10)  
Ingredient Sequence Number: 09  
NIOSH (RTECS) Number: 9999999ZZ

Proprietary: NO  
Ingredient: ING 9:MAY OCCUR WITHIN A FEW WEEKS/MAY BE DELAYED FOR MONTHS  
OR EVEN YEARS. DEATH MAY RESULT FROM ASPHYXIA, (SEE ING 11)  
Ingredient Sequence Number: 10  
NIOSH (RTECS) Number: 9999999ZZ

Proprietary: NO  
Ingredient: ING 10:CIRCULATORY COLLAPSE OR ASPIRATION. (CHRONIC) INFLAMM  
OR ULCEPATIVE CHANGES OF THE MUCOUS MEMBRANES. (SEE ING 12)  
Ingredient Sequence Number: 11  
NIOSH (RTECS) Number: 9999999ZZ

Proprietary: NO  
Ingredient: ING 11:LATER DEATH MAY BE FROM PERITONITIS, SEVERE NEPHRITIS  
OR PNEUMONIA. FIRST AID PROC:COVER W/STERILE (SEE ING 13)  
Ingredient Sequence Number: 12  
NIOSH (RTECS) Number: 9999999ZZ

Proprietary: NO  
Ingredient: ING 12 BANDAGES, GET MD IMMED. INGEST:DO NOT USE GASTRIC  
LAVAGE/EMESIS. DILUTE BY GIVING LG QTY OF WATER (SEE ING 14)  
Ingredient Sequence Number: 13  
NIOSH (RTECS) Number: 9999999ZZ

Proprietary: NO  
Ingredient: ING 13:OR MILK. IF VOMITING PERSISTS, GIVE FLUIDS RPTDLY. ACID  
MUST BE DILUTED 100 FOLD. MAINTAIN AIRWAY, (SEE ING 15)  
Ingredient Sequence Number: 14  
NIOSH (RTECS) Number: 9999999ZZ

Proprietary: NO  
Ingredient: ING 14:TREAT FOR SHOCK. GET MD IMMED. KEEP HEAD BELOW HIPS  
WHEN VOMITING. HANDLG/STOR PREC-ORGANIC OR OTHER (SEE ING 16)  
Ingredient Sequence Number: 15  
NIOSH (RTECS) Number: 9999999ZZ

Proprietary: NO  
Ingredient: ING 15:READILY OXIDIZABLE MATLS. PROVIDE GOOD VENTILATION AND  
AVOID DIRECT SUNLIGHT. SPILL PROC:KEEP (SEE ING 17)  
Ingredient Sequence Number: 16  
NIOSH (RTECS) Number: 9999999ZZ

Proprietary: NO

Ingredient: ING 16: UNNECESSARY PEOPLE AWAY. ISOLATE HAZARD AREA & DENY ENTRY. VENTILATE CLOSED SPACES BEFORE ENTERING.

Ingredient Sequence Number: 17

NIOSH (RTECS) Number: 9999999ZZ

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#### Physical/Chemical Characteristics

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Appearance And Odor: COLORLESS TO PALE YELLOW LIQUID WITH A SUFFOCATING ODOR

Boiling Point: 181F, 83C

Melting Point: -44F, -42C

Vapor Pressure (MM Hg/70 F): 47.9

Vapor Density (Air=1): 3.2

Specific Gravity: 1.5027

Solubility In Water: VERY SOLUBLE

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#### Fire and Explosion Hazard Data

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Flash Point: N/A

Lower Explosive Limit: N/A

Upper Explosive Limit: N/A

Extinguishing Media: WATER, DRY CHEMICAL OR SODA ASH. LARGER FIRES, FLOOD AREA WITH WATER FROM A DISTANCE.

Special Fire Fighting Proc: USE NIOSH/MSHA APPRVD SCBA & FULL PROT EQUIP (FP N). MOVE CNTNR FROM FIRE AREA IF W/O RISK. APPLY COOLING WATER TO SIDES EXPOSED TO FLAMES UNTIL (SEE SUPP DATA)

Unusual Fire And Expl Hazrds: OXIDIZERS DECOMPOSE WHEN HEATED/INCR BURN RATE OF COMBUST MATL. CNTCT W/EASILY OXIDIZABLE, ORG/OTHER COMBUST MATLS MAY RESULT IN IGNIT, VIOLENT COMBUST/EXPLOS.

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#### Reactivity Data

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Stability: YES

Cond To Avoid (Stability): REACTS EXOTHERMICALLY WITH WATER.

Materials To Avoid: ACETYLENE, ORGANICS, WATER, AMMONIA, AMINES, NITROGEN DIOXIDE, CARBOHYDRATES, ORGANIC ACID, STRONG (SEE INGRED 3)

Hazardous Decomp Products: REACTS EXOTHERMICALLY WITH WATER.

Hazardous Poly Occur: NO

Conditions To Avoid (Poly): NOT RELEVANT

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#### Health Hazard Data

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LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Route Of Entry - Inhalation: YES

Route Of Entry - Skin: NO

Route Of Entry - Ingestion: NO

Health Haz Acute And Chronic: INHAL:(ACUTE) SEVERE RESP IRRIT, W/POSS MUC MEMB BURNS. PULMONARY EDEMA MAY OCCUR IMMEDIATE OR DELAYED 5-72 HRS. (CHRONIC) EROSION OF TEETH, INFLAMMATION & POSS ULCERS TO MOUTH & POSS JAW NECROSIS. BRONCHIAL INFLAMM & POTNTL BRONCHIAL ASTHMA. SKIN:(ACUTE) SEVERE PAIN, BURNS & POSS YELLOW STAINS. BURNS MAY (SEE INGRED 3)

Carcinogenicity - NTP: NO

Carcinogenicity - IARC: NO

Carcinogenicity - OSHA: NO

Explanation Carcinogenicity: NOT RELEVANT

Signs/Symptoms Of Overexp: INHAL: COUGHING, CHOKING, DIZZINESS, HEADACHE, NAUSEA, WEAKNESS. TIGHTNESS IN CHEST, DYSPNEA, FROTHY SPUTUM & CYANOSIS, HYPOTENSION. SKIN: PAIN & DISCOLORATION. EYE: EXCESSIVE LACRIMATION, PAIN, PHOTOPHOBIA. INGEST: MARKED THIRST, NAUSEA, VOMITING, DIARRHEA, BLOOD TINGED VOMITUS, WEAK PULSE, SHALLOW RESPIRATION.

Med Cond Aggravated By Exp: IMPAIRED PULMONARY FUNCTION, PRE-EXISTING EYE AND SKIN DISORDERS.

Emergency/First Aid Proc: INHAL: REMOVE TO FRESH AIR. SUPPORT BRTHG

(O\*2/ARTF RESP), GET MD IMMEDIATE. SKIN: REMOVE CONTAM CLTHG/SHOES IMMEDIATE. WASH W/MILD SOAP & LG QTY OF WATER FOR AT LEAST 15-20 MINS. IN CASE OF CHEM BURNS, COVER W/ DRY, STERILE DRSG, BANDAGE. GET MD IMMEDIATE. EYES: FLUSH IMMEDIATE

W/ 1 GALLONS OF WATER FOR AT LEAST 15-20 MINS. CONTINUE IRRIGATION W/STERILE WATER UNTIL PH HAS RETURNED TO NORMAL (30-60 MINS) (SEE INGRED 12)

#### Precautions for Safe Handling and Use

Steps If Matl Released/Spill: KEEP COMBUST AWAY FROM SPILLED MATL. DO NOT TOUCH MATL. STOP LEAK IF W/O RISK. USE WATER SPRAY TO REDUCE VAPS. DO NOT GET WATER INSIDE CNTNR. SMALL FLUSH AREA W/FLOODING AMTS OF WATER. LG DIKE FAR AHEAD OF SPILL FOR LATER DISPOSAL. (SEE INGRED 16)  
Neutralizing Agent: SLAKED LIME, SODIUM BICARBONATE OR CRUSHED LIMESTONE.  
Waste Disposal Method: DISPOSAL MUST BE I/A/W STANDARDS APPLICABLE TO GENERATORS OF HAZARDOUS WASTE, 40 CFR 262, EPA HAZARDOUS WASTE NUMBER D002. REPORTABLE QUANTITY: 1000 POUNDS.  
Precautions-Handling/Storing: PROTECT AGAINST PHYSICAL DAMAGE. SEPARATE FROM METALLIC POWDERS, CARBIDES, HYDROGEN SULFIDE, TURPENTINE, ORGANIC ACIDS & ALL COMBUST, (SEE INGRED 15)  
Other Precautions: MAY IGNITE OTHER COMBUSTIBLE MATLS. REACTS VIOLENTLY W/ WATER AND FUELS. FLAMMABLE, POISONOUS GASES MAY ACCUMULATE IN TANKS & HOPPER CARS. RUNOFF TO SEWER MAY CREATE FIRE OR EXPLOSION HAZARD.

#### Control Measures

Respiratory Protection: USE NIOSH/MSHA APPRVD RESP EQUIP. CONC: 125 MG/M3. SUPPLIED AIR RESP IN CONTINUOUS FLOW MODE. 250 MG/M3. SCBA W/FULL FACEPIECE, AIR PURIFYING, FULL FACEPIECE (GAS MASK), CHEMICAL CARTRIDGE W/ FULL FACEPIECE  
Ventilation: PROVIDE LOCAL EXHAUST VENTILATION SYSTEM TO MEET PUBLISHED EXPOSURE LIMITS  
Protective Gloves: IMPERVIOUS GLOVES (FP N).  
Eye Protection: CHEM WORKERS GOGG. MAY ADD FULL (SEE SUPP)  
Other Protective Equipment: DELUGE SHOWER. EMERGENCY WASH FACILITIES, IMPERVIOUS CLOTHING AND EQUIPMENT.  
Work Hygiene Practices: WASH HANDS THOROUGHLY AFTER USE AND BEFORE EATING, SMOKING OR USING SANITARY FACILITIES (FP N).  
Suppl. Safety & Health Data: FIREFIGHT PROC: WELL AFTER FIRE OUT. AVOID ENDS OF TANKS. FOR MASSIVE FIRE, CARGO AREA, USE UNMANNED HOSE HOLDER/MONITOR NOZZLES; IF IMPOSS, GET OUT/LET FIRE BURN. USE FLOODING AMTS/WATER AS FOG. COOL CNTNRS W/FLOODING AMTS/WATER, APPLY FROM A FAR. AVOID BRTHG CORR VAP. KEEP UPWIND. EYE PROT: LENGTH FACE SHIELD TO GOGG (FP N).

#### Transportation Data

Trans Data Review Date: 9/12/14  
DOT PSN Code: KFD  
DOT Proper Shipping Name: NITRIC ACID  
DOT Class: 8  
DOT ID Number: UN2031  
DOT Pack Group: II  
DOT Label: CORROSIVE  
IMO PSN Code: KPI  
IMO Proper Shipping Name: NITRIC ACID  
IMO Regulations Page Number: 8195  
IMO UN Number: 2031  
IMO UN Class: 8  
IMO Subsidiary Risk Label: -  
ATA PSN Code: RWF  
ATA UN ID Number: 2031  
ATA Proper Shipping Name: NITRIC ACID  
ATA UN Class: 8  
ATA Label: CORROSIVE  
AFI PSN Code: RWF  
AFI Symbols: 0  
AFI Prop. Shipping Name: NITRIC ACID  
AFI Class: 8  
AFI ID Number: UN2031  
AFI Pack Group: II



AFI Label: CORROSIVE  
AFI Basic Pac Ref: 12-14

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Disposal Data

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Label Data

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Label Required: YES  
Technical Review Date: 10JUN91  
Label Date: 10JUN91  
Label Status: G  
Common Name: NITRIC ACID (A-200)  
Chronic Hazard: YES  
Signal Word: DANGER!  
Acute Health Hazard-Moderate: X  
Contact Hazard-Severe: X  
Fire Hazard-None: X  
Reactivity Hazard-Moderate: X  
Special Hazard Precautions: ACUTE: CORROSIVE TO ALL TISSUES. SKIN: MAY CAUSE DEEP SEVERE BURNS. EYES: MAY CAUSE BLINDNESS. INGEST: MAY CAUSE SEVERE GI BURNS/ULCERATION. MAY CAUSE PERFORATIONS OF GI TRACT. MAY LEAD TO CIRCULATORY COLLAPSE AND/OR NEPHRITIS. INHAL: MAY CAUSE SEVERE RESPIRATORY IRRITATION AND PULMONARY EDEMA, PERHAPS FATAL. CHRONIC: EROSION OF TEETH, JAW NECROSIS, FREQUENT ATTACKS OF BRONCHIAL PNEUMONIA, GI DISTURBANCES.  
Protect Eye: Y  
Protect Skin: Y  
Protect Respiratory: Y  
Label Name: FISHER SCIENTIFIC  
Label Street: 1 REAGENT LANE  
Label City: FAIR LAWN  
Label State: NJ  
Label Zip Code: 07410  
Label Country: US  
Label Emergency Number: 201-796-7100;800-424-9300(CHEMTREC)

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URL for this msds <http://siri.org>. If you wish to change, add to, or delete information in this archive please send updates to [dan@siri.org](mailto:dan@siri.org).

CHEM SERVICE -- SODIUM HYDROXIDE, I-136  
MATERIAL SAFETY DATA SHEET  
NSN: 681000N067534  
Manufacturer's CAGE: 8Y898  
Part No. Indicator: A  
Part Number/Trade Name: SODIUM HYDROXIDE, I-136

=====

General Information

=====

Company's Name: CHEM SERVICE INC  
Company's P. O. Box: 3108  
Company's City: WEST CHESTER  
Company's State: PA  
Company's Country: US  
Company's Zip Code: 19381  
Company's Emerg Ph #: 215-692-3025  
Company's Info Ph #: 215-692-3026  
Safety Data Action Code: C  
Record No. For Safety Entry: 001  
Tot Safety Entries This Stk#: 001  
Status: SMJ  
Date MSDS Prepared: 01SEP88  
Safety Data Review Date: 18DEC95  
MSDS Serial Number: CBGBK

=====

Ingredients/Identity Information

=====

Proprietary: NO  
Ingredient: SODIUM HYDROXIDE (CERCLA)  
Ingredient Sequence Number: 01  
NIOSH (RTECS) Number: WB4900000  
CAS Number: 1310-73-2  
OSHA PEL: 2 MG/M3  
ACGIH TLV: C 2 MG/M3

=====

Proprietary: NO  
Ingredient: FIRST AID PROC: INHALE: REMOVE TO FRESH AIR. ADMIN OXYG IF  
PATIENT IS HAVING DIFFICULTY BRTHG. IF PATIENT HAS STOPPED (ING 3)  
Ingredient Sequence Number: 02  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

=====

Proprietary: NO  
Ingredient: ING 2: BRTHG ADMIN ARTF RESP. IF PATIENT IS EXHIBITING SIGNS OF  
SHOCK-KEEP WARM & QUIET. GET MED ATTN IF NEC. IF (ING 4)  
Ingredient Sequence Number: 03  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

=====

Proprietary: NO  
Ingredient: ING 3: PATIENT IS IN CARDIAC ARREST ADMIN CPR. CONTINUE LIFE  
SUPPORTING MEASURES UNTIL MED ASSISTANCE HAS ARRIVED. (ING 5)  
Ingredient Sequence Number: 04  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

=====

Proprietary: NO  
Ingredient: ING 4: INGEST: DO NOT ADMIN LIQS/INDUCE VOMIT TO AN UNCON/  
CONVULSING PERSON. IF SWALLOWED DRINK 1-2 GLASSES OF (ING 6)  
Ingredient Sequence Number: 05  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

Proprietary: NO

Ingredient: ING 5: WATER. IF SWALLOWED DO NOT INDUCE VOMIT. CONT POIS CTL  
CTR IMMED IF NEC. GET MED ATTN IF NEC. IF PATIENT (ING 7)

Ingredient Sequence Number: 06

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

Proprietary: NO

Ingredient: ING 6: IS VOMITING-WATCH CLOSELY TO MAKE SURE AIRWAY DOES NOT  
BECOME OBSTRUCTED BY VOMIT.

Ingredient Sequence Number: 07

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

---

#### Physical/Chemical Characteristics

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Appearance And Odor: WHITE CRYSTALLINE SOLID.

Boiling Point: 2534F, 1390C

Melting Point: 604F, 318C

Vapor Density (Air=1): 2.13

Solubility In Water: SOLUBLE

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#### Fire and Explosion Hazard Data

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Flash Point: NON FLAMMABLE

Extinguishing Media: CARBON DIOXIDE OR DRY CHEMICAL POWDER. DO NOT USE  
WATER.

Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED SCBA & FULL  
PROTECTIVE EQUIPMENT (FP N).

Unusual Fire And Expl Hazrds: NONE SPECIFIED BY MANUFACTURER.

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#### Reactivity Data

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Stability: YES

Cond To Avoid (Stability): DO NOT USE MAGNESIUM/ALUMINUM OR THEIR ALLOYS  
AS CONTAINERS.

Materials To Avoid: REACTS W/WATER & MOST REACTIVE HYDROGEN CMPDS, ACID  
HALIDES & ANHYDRIDES, ALCOHOLS, AMIDES, PHOSPHORUS HALIDES, (SUPDAT)

Hazardous Decomp Products: DECOMPOSITION LIBERATES TOXIC FUMES.

HYGROSCOPIC. DECOMPOSED BY CHLORINE GAS. AIR SENSITIVE. \*

Hazardous Poly Occur: DO \*

Conditions To Avoid (Poly): NOT RELEVANT \*

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#### Health Hazard Data

---

LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER. \*

Route Of Entry - Inhalation: YES \*

Route Of Entry - Skin: YES \*

Route Of Entry - Ingestion: YES \*

Health Haz Acute And Chronic: CONT LENSES SHOULD NOT BE WORN IN LAB. ALL  
CHEMS SHOULD BE CONSIDERED HAZ-AVOID DIRECT PHYSICAL CONT! VAPS &/OR DIRECT  
EYE CONT CAN CAUSE SEV EYE BURNS. CAN BE HARMFUL IF ABSORBED THRU SKIN. CAN  
CAUSE SEV SKIN BURNS. RPTD EXPOS TO VAPS &/OR DUST CAN CAUSE EYE INJURY.  
VAPS CAN CAUSE SEV EYE INFLAM & (EFTS OF OVEREXP) \*

Carcinogenicity - NTP: NO \*

Carcinogenicity - IARC: NO \*

Carcinogenicity - OSHA: NO \*

Explanation Carcinogenicity: NOT RELEVANT \*

Signs/Symptoms Of Overexp: HLTH HAZS: SWELLING OF ADJOINING TISS. DUST & OR  
VAPS CAN CAUSE IRRIT TO RESP TRACT. MAY BE FATAL IF SWALLOWED! CAN CAUSE GI  
DISTURBS. POSSIBLE CHOLINESTERASE INHIBITOR-MAY CAUSE SEIZURES; NAUS;  
VOMIT; AIRWAY OBSTRUCTION &/OR INCR MUC SECRETIONS IN LUNGS. INGEST MAY  
CAUSE SEV CORR OF MOUTH & GI TRACT & MAY (SUP DAT) \*

Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER. •  
Emergency/First Aid Proc: AN ANTIDOTE IS SUBSTANCE INTENDED TO COUNTERACT  
EFT OF POIS. IT SHOULD BE ADMIN ONLY BY MD/TRAINED EMER PERS. MED ADVICE  
CAN BE OBTAINED FROM POIS CTL CTR. EYES: FLUSH CONTINUOUSLY W/ WATER FOR @  
1ST 15 MIN. SKIN: FLUSH W/ WATER FOR 15-20 MIN. IF NO BURNS HAVE OCCURRED-USE  
SOAP & WATER TO CLEANSE. REMOVE & WASH CONTAM CLTHG. DO NOT WEAR  
SHOES/CLTHG UNTIL ABSOLUTELY FREE OF ALL CHEM ODORS. (ING 2) •

#### Precautions for Safe Handling and Use

Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROPRIATE OSHA-  
REGULATED EQUIPMENT. VENTILATE AREA. SWEEP UP AND PLACE IN AN APPROPRIATE  
CONTAINER. HOLD FOR DISPOSAL. WASH CONTAMINATED SURFACES TO REMOVE ANY  
RESIDUES •

Neutralizing Agent: NEUTRALIZE WITH SODIUM BISULFATE. •

Waste Disposal Method: DISPOSAL MUST BE I/A/W FEDERAL, STATE & LOCAL  
REGULATIONS (FP N). NEUTRALIZE WITH SODIUM BISULFATE AND FLUSH TO SEWER. •

Precautions-Handling/Storing: USE APPROP OSHA/MSMA APPRVD SFTY EQUIP.  
AVOID CONT W/SKIN, EYES & CLTHG. KEEP TIGHTLY CLSD & STORE IN COOL, DRY  
PLACE. STORE ONLY W/COMPATIBLE CHEMS. •

Other Precautions: PERSONS NOT SPECIFICALLY & PROPERLY TRAINED SHOULD NOT  
HNDL CHEM/ITS CNTNR. FURNISHED FOR LAB USE ONLY! MAY NOT BE USED AS DRUGS,  
COSMETICS, AGRICULTURAL/PESTICIDAL PRODS, FOOD ADDITIVES/AS HOUSEHOLD  
CHEMS. •

#### Control Measures

Respiratory Protection: USE NIOSH/MSHA APPROVED RESPIRATOR. •

Ventilation: THIS CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD. •

Protective Gloves: IMPERVIOUS GLOVES (FP N). •

Eye Protection: ANSI APPRVD CHEM WORKERS GOGGLES (SUPDAT). •

Other Protective Equipment: ANSI APPROVED EMERGENCY EYE WASH AND DELUGE  
SHOWER (FP N). •

Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER. •

Suppl. Safety & Health Data: MATLS TO AVOID: THIONYL CHLORIDE. INCOMPATIBLE  
WITH STRONG ACIDS & IRON, ZINC & OTHER LIGHT METALS. CORR. EFTS OF  
OVEREXP: CAUSE DIARR. CAN BE IRRIT TO MUC MEMBS. CHRONIC EXPOS MAY CAUSE  
BRONCH. ASSUME CHEM IS TOX & USE SPECIAL CARE TO AVOID CONT. EYE PROT: AND  
FULL LENGTH FACE SHIELD (FP N). •

#### Transportation Data

#### Disposal Data

#### Label Data

Label Required: YES

Technical Review Date: 18DEC95

Label Status: B

Common Name: SODIUM HYDROXIDE, I-136

Flame Hazard: YES

Signal Word: DANGER!

Acute Health Hazard-Severe: X

Contact Hazard-Severe: X

Env Hazard-None: X

Reactivity Hazard-Slight: X

Special Hazard Precautions: CORROSIVE. ACUTE VAPS &/OR DIRECT EYE CONT CAN  
CAUSE SEV EYE BURNS. CAN BE HARMFUL IF ABSORBED THRU SKIN. CAN CAUSE SEV  
SKIN BURNS. RPTD EXPOS TO VAPS &/OR DUST CAN CAUSE EYE INJURY. VAPS CAN  
CAUSE SEV EYE INFLAM & SWELLING OF ADJOINING TISSUES. CAN BE HARMFUL IF  
INHALED. CAN CAUSE DELAYED LUNG INJURY. DUST AND/OR VAPORS CAN IRRITATE  
RESPIRATORY TRACT. MAY BE FATAL IF SWALLOWED. CAN CAUSE GASTROINTESTINAL  
DISTURBANCES. POSSIBLE CHOLINESTERASE INHIBITOR-MAY CAUSE SEIZURES, NAUSEA,  
VOMITING, AIRWAY OBSTRUCTION AND/OR INCREASED MUCOUS SECRETIONS IN LUNGS

INGESTION MAY CORRODE MOUTH AND GI TRACT. CHRONIC: EXPOSURE MAY CAUSE  
BRONCHITIS.

Protect Eye: X

Protect Skin: X

Protect Respiratory: X

Label Name: CHEM SERVICE INC

Label P.O. Box: 3108

Label City: WEST CHESTER

Label State: PA

Label Zip Code: 19381

Label Country: US

Label Emergency Number: 215-692-3026

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URL for this msds <http://siri.org>. If you wish to change, add to, or  
delete information in this archive please send updates to [dan@siri.org](mailto:dan@siri.org).

FISHER SCIENTIFIC CHEMICAL DIV -- SULFURIC ACID - SULFURIC ACID  
MATERIAL SAFETY DATA SHEET  
NSN: 681000F000325  
Manufacturer's CAGE: 1B464  
Part No. Indicator: A  
Part Number/Trade Name: SULFURIC ACID

General Information

Item Name: SULFURIC ACID  
Company's Name: FISHER SCIENTIFIC, CHEMICAL DIV.  
Company's Street: 1 REAGENT LANE  
Company's City: FAIR LAWN  
Company's State: NJ  
Company's Country: US  
Company's Zip Code: 07410  
Company's Emerg Ph #: 201-796-7100/800-424-9300(CHEMTREC)  
Company's Info Ph #: 201-796-7100 OR 201-796-7523  
Record No. For Safety Entry: 001  
Tot Safety Entries This Stk#: 001  
Status: SE  
Date MSDS Prepared: 18MAY90  
Safety Data Review Date: 01JUN94  
Supply Item Manager: CX  
MSDS Preparer's Name: GASTON L. PILLORI  
MSDS Serial Number: BBGJZ  
Specification Number: NONE  
Spec Type, Grade, Class: NONE  
Hazard Characteristic Code: C1

Ingredients/Identity Information

Proprietary: YES  
Ingredient: PROPRIETARY  
Ingredient Sequence Number: 01

Physical/Chemical Characteristics

Appearance And Odor: CLEAR, COLORLESS, DENSE HYGROSCOPIC OILY LIQUID.  
ODORLESS.  
Boiling Point: 559F, 293C  
Melting Point: 50.0F, 10.0C  
Vapor Pressure (MM Hg/70 F): <0.001  
Vapor Density (Air=1): 3.4  
Specific Gravity: 1.84  
Decomposition Temperature: 644F, 340C  
Evaporation Rate And Ref: UNKNOWN  
Solubility In Water: SOLUBLE  
pH: <3  
Corrosion Rate (IPY): UNKNOWN

Fire and Explosion Hazard Data

Flash Point: NOT APPLICABLE  
Extinguishing Media: USE AGENT SUITABLE FOR TYPE OF FIRE. DRY CHEMICAL,  
CARBON DIOXIDE, HALON. (1987 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.4).  
Special Fire Fighting Proc: USE FLOODING AMOUNTS OF WATER AS A FOG. COOL  
CONTAINERS WITH FLOODING AMOUNTS OF WATER. KEEP AWAY FROM STORAGE TANK  
ENDS. FLOOD AREA WITH WATER FROM A DISTANCE.  
Unusual Fire And Expl Hazards: NEGLIGIBLE FIRE HAZARD. STRONG OXIDIZING  
AGENT THAT WHEN CONTACTING OXIDIZABLE, ORGANIC, OTHER COMBUSTIBLES MAY  
CAUSE VIOLENT COMBUSTION OR EXPLOSION.

Reactivity Data

Stability: YES

Cond To Avoid (Stability): VIOLENT EXOTHERMIC REACTION WITH WATER.  
Materials To Avoid: WATER, OXIDIZABLES, ORGANICS, METALS, CARBIDES,  
CHLORATES, FULMINATES, NITRATES, PICRATES, POWDERED METALS, COMBUSTIBLES.  
Hazardous Decomp Products: TOXIC SULFUR OXIDE FUMES FROM THERMAL  
DECOMPOSITION.  
Hazardous Poly Occur: NO  
Conditions To Avoid (Poly): HAZARDOUS POLYMERIZATION HAS NOT BEEN REPORTED  
TO OCCUR UNDER NORMAL TEMPERATURES AND PRESSURES.

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#### Health Hazard Data

---

LD50-LC50 Mixture: ORAL LD50 (RAT) IS 2140 MG/KG.  
Route Of Entry - Inhalation: YES  
Route Of Entry - Skin: YES  
Route Of Entry - Ingestion: YES  
Health Haz Acute And Chronic: ACUTE: EYES: CORROSIVE, CORNEAL DAMAGE,  
BLINDNESS. SKIN: BURNS, NECROSIS, SCARING. INHALATION: CORROSIVE/HIGHLY  
TOXIC. MUCOUS MEMBRANE IRRITATION, LOSS OF CONSCIOUSNESS, DAMAGE TO LUNG  
TISSUE, PULMONARY EDEMA. INGESTION: CORROSIVE TO MEMBRANES OF MOUTH THROUGH  
GI TRACT. CHRONIC: CONJUNCTIVITIS, DERMATITIS, EMPHYSEMA.  
Carcinogenicity - NTP: NO  
Carcinogenicity - IARC: NO  
Carcinogenicity - OSHA: NO  
Explanation Carcinogenicity: NONE  
Signs/Symptoms Of Overexp: EYES: IRRITATION, BURNING, CORNEAL DAMAGE,  
MUCOUS MEMBRANE IRRITATION, RAPID BREATHING, NASAL SECRETIONS, SNEEZING,  
BURNING PAIN IN MOUTH, THROAT, ESOPHAGUS AND ABDOMEN.  
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.  
Emergency/First Aid Proc: EYES: FLUSH WITH LARGE AMOUNTS OF WATER AND  
NORMAL SALINE. COVER WITH BANDAGES. GET MEDICAL ATTENTION. SKIN: REMOVE  
CONTAMINATED CLOTHING. WASH AREA WITH SOAP AND WATER. COVER BURNS WITH DRY  
DRESSING. GET MEDICAL ATTENTION. INHALATION: MOVE TO FRESH AIR. SUPPORT  
BREATHING. GET MEDICAL ATTENTION. INGESTION: DO NOT USE GASTRIC LAVAGE/  
EMESIS, DRINK LARGE AMOUNTS OF WATER/MILK. GET MEDICAL ATTENTION.

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#### Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: CONTAIN SPILL. KEEP COMBUSTIBLES AWAY.  
NEUTRALIZE WITH SLAKED LIME, SODIUM BICARBONATE, OR CRUSHED LIMESTONE. DO  
NOT APPLY WATER UNLESS DIRECTED TO DO SO. REPORTABLE QUANTITY(RQ): 1000  
POUNDS.  
Neutralizing Agent: SLAKED LIME, SODIUM BICARBONATE, CRUSHED LIMESTONE,  
AGRICULTURAL LIME.  
Waste Disposal Method: DISPOSE OF WASTE IN ACCORDANCE WITH LOCAL, STATE  
AND FEDERAL REGULATIONS. EPA HAZARDOUS WASTE NUMBER D002. 100 POUND CERCLA  
SECTION 103 REPORTABLE QUANTITY.  
Precautions-Handling/Storing: OBSERVE ALL FEDERAL, STATE AND LOCAL  
REGULATIONS WHEN STORING THIS SUBSTANCE. CONTACT DISTRICT DIRECTOR OF  
ENVIRONMENTAL PROTECTION AGENCY.  
Other Precautions: PROTECT AGAINST PHYSICAL DAMAGE AND WATER. SEPARATE  
FROM INCOMPATIBLE SUBSTANCES.

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#### Control Measures

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Respiratory Protection: IF RECOMMENDED TLV EXCEEDED WEAR NIOSH/MSHA  
APPROVED RESPIRATOR SELECTED BASED ON THE CONTAMINATION LEVELS FOUND IN THE  
WORK PLACE. FIREFIGHTERS WEAR SCBA WITH FULL FACEPIECE OPERATED IN  
PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE.  
Ventilation: PROVIDE ADEQUATE MECHANICAL (GENERAL) AND LOCAL EXHAUST  
VENTILATION TO MAINTAIN EXPOSURE BELOW ESTABLISHED LIMITS.  
Protective Gloves: WEAR APPROPRIATE PROTECTIVE GLOVES.  
Eye Protection: SAFETY GOGGLES AND FACESHIELD.  
Other Protective Equipment: WEAR APPROPRIATE PROTECTIVE CLOTHING TO AVOID  
SKIN CONTACT. PROVIDE EYE WASH STATION AND SAFETY SHOWER.  
Work Hygienic Practices: WASH AFTER HANDLING AND BEFORE EATING, DRINKING,  
OR SMOKING. LAUNDRY CONTAMINATED CLOTHING BEFORE REUSE.

Suppl. Safety & Health Data: NONE

Transportation Data

Disposal Data

Disposal Data Review Date: 88043  
Rec # For This Disp Entry: 01  
Tot Disp Entries Per NSN: 001  
Landfill Ban Item: YES  
Disposal Supplemental Data: P.O. BOX 375, 1 REAGENT LANE/ FAIR LAWN, NJ  
07410 IN CASE OF ACCIDENTAL EXPOSURE OR DISCHARGE, CONSULT HEALTH AND  
SAFETY FILE FOR PRECAUTIONS.  
1st EPA Haz Wst Code New: D002  
1st EPA Haz Wst Name New: CORROSIVE  
1st EPA Haz Wst Char New: CORROSIVITY  
1st EPA Acute Hazard New: NO

Label Data

Label Required: YES  
Technical Review Date: 01JUN94  
Label Status: F  
Common Name: SULFURIC ACID  
Chronic Hazard: YES  
Signal Word: DANGER  
Acute Health Hazard-Severe: X  
Contact Hazard-Severe: X  
Fire Hazard-None: X  
Reactivity Hazard-Severe: X  
Special Hazard Precautions: CORROSIVE TO EYES, SKIN, RESPIRATORY SYSTEM.  
HIGHLY TOXIC BY INHALATION; MODERATELY TOXIC BY INGESTION. CONTAIN SPILLS  
KEEP COMBUSTIBLES AWAY. NEUTRALIZE WITH SLAKED LIME, SODIUM BICARBONATE, OR  
REMOVE CONTAMINATED CLOTHING. WASH AREA WITH SOAP AND WATER. GET MEDICAL  
ATTENTION. INHALATION: MOVE TO FRESH AIR. SUPPORT BREATHING. GET MEDICAL  
ATTENTION. INGESTION: DRINK LARGE AMOUNTS OF WATER/MILK. GET MEDICAL  
ATTENTION. TARGET ORGANS: RESPIRATORY SYSTEM, EYES, SKIN, TEETH, CNS.  
Protect Eye: Y  
Protect Skin: Y  
Protect Respiratory: Y  
Label Name: FISHER SCIENTIFIC, CHEMICAL DIV.  
Label Street: 1 REAGENT LANE  
Label City: FAIR LAWN  
Label State: NJ  
Label Zip Code: 07410  
Label Country: US  
Label Emergency Number: 201-796-7100/800-424-9300(CHEMTREC)

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**APPENDIX F.3**  
**MSDS - GASES**

## **APPENDIX F.3 MSDS - GASES**

The following MSDS sheets are included:

- Hydrogen                      pg. F.3. 2-5
- Nitrogen                      pg. F.3. 6-9
- Oxygen                      pg. F.3. 10-12

SCIENTIFIC GAS PRODUCTS - HYDROGEN  
MATERIAL SAFETY DATA SHEET  
NSN: 683000N044251  
Manufacturer's CAGE: 54262  
Part No. Indicator: A  
Part Number/Trade Name: HYDROGEN

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General Information

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Company's Name: SCIENTIFIC GAS PRODUCTS INC  
Company's Street: 2330 HAMILTON BLVD  
Company's P. O. Box: 648  
Company's City: SOUTH PLAINFIELD  
Company's State: NJ  
Company's Country: US  
Company's Zip Code: 07080  
Company's Emerg Ph #: 201-754-7700  
Company's Info Ph #: 201-754-7700  
Record No. For Safety Entry: 001  
Tot Safety Entries This Sdk#: 001  
Status: SMJ  
Date MSDS Prepared: 12APR93  
Safety Data Review Date: 18OCT95  
MSDS Serial Number: BTLSD  
Hazard Characteristic Code: G2

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Ingredients/Identity Information

---

Proprietary: NO  
Ingredient: HYDROGEN  
Ingredient Sequence Number: 01  
NIOSH (RTECS) Number: MW8900000  
CAS Number: 1333-74-0  
OSHA PEL: N/K (FP N)  
ACGIH TLV: SIMPLE ASPHYXIAN

Proprietary: NO  
Ingredient: SUPP DATA:SYS MUST BE CHECKED FOR LEAKS USING AN AQ SOAP SOLN.  
ALL SYS EQUIP & LINES MUST BE ELECTRICALLY (ING 3)  
Ingredient Sequence Number: 02  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

Proprietary: NO  
Ingredient: ING 2:GROUNDED, ESP GLASSWARE & PLASTIC TUBING WHICH ARE PRONE  
TO STATIC ELECTRICITY BUILD-UP. DOWNSTREAM EQUIP (ING 4)  
Ingredient Sequence Number: 03  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

Proprietary: NO  
Ingredient: ING 3:MUST BE DESIGNED TO HANDLE MAXIMUM PRESS TO WHICH IT  
WILL BE EXPOSED. USE EXPLOS-PROOF MOTORS, TOOLS, (ING 5)  
Ingredient Sequence Number: 04  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

Proprietary: NO  
Ingredient: ING 4:LIGHTS & FIXTURES IN WORK AREA. TRANSPORT ALL COMPRESSED  
GAS CYL W/AN APPROP CYL CART OR TRUCK. USE A (ING 6)  
Ingredient Sequence Number: 05

NIOSH (RTECS) Number: 999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

-----  
Proprietary: NO  
Ingredient: ING 5-FLAMMABLE GAS MONITOR AT ALL TIMES WHEN WORKING W/  
HYDROGEN  
Ingredient Sequence Number: 06  
NIOSH (RTECS) Number: 999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE  
-----

Physical/Chemical Characteristics

-----  
Appearance And Odor: COLORLESS, ODORLESS GAS.  
Boiling Point: -423F, -253C  
Vapor Pressure (MM Hg/70 F): N/A  
Vapor Density (Air=1): 0.069  
Specific Gravity: N/A  
Evaporation Rate And Ref: NOT APPLICABLE  
Solubility In Water: 0.019 CC/CC WATER  
Percent Volatiles By Volume: 100  
-----

Fire and Explosion Hazard Data

-----  
Flash Point: FLAMMABLE GAS  
Lower Explosive Limit: 4%  
Upper Explosive Limit: 74.2%  
Extinguishing Media: CARBON DIOXIDE, DRY CHEMICAL OR HALON  
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPRVD SCBA & FULL PROT EQUIP  
(FP N). IF POSS, ELIM SOURCE OF GAS. OTHERWISE, ALLOW FIRE TO BURN UNDER  
CONTROL UNTIL GAS SUPPLY IS (SUP DAT)  
Unusual Fire And Expl Hazrds: IF FLAMES ARE EXTINGUISHED PRIOR TO  
ELIMINATING GAS SUPPLY, EXPLOS REIGNITION MAY OCCUR. HYDROGEN BURNS W/NO  
EVIDENT FLAME. DO NOT ENTER DANGER AREA (SUP DAT)  
-----

Reactivity Data

-----  
Stability: YES  
Cond To Avoid (Stability): SPARKS, OPEN FLAMES & EXCESSIVE TEMPERATURES.  
Materials To Avoid: OXIDIZERS.  
Hazardous Decomp Products: NONE.  
Hazardous Poly Occur: NO  
Conditions To Avoid (Poly): NOT RELEVANT.  
-----

Health Hazard Data

-----  
LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.  
Route Of Entry - Inhalation: YES  
Route Of Entry - Skin: NO  
Route Of Entry - Ingestion: NO  
Health Haz Acute And Chronic: TLV: SIMPLE ASPHYXIAN. CAUSES ASPHYXIATION  
IF ALLOWED TO DISPLACE THE OXYGEN CONTENT IN THE ATMOSPHERE NECESSARY TO  
SUSTAIN LIFE.  
Carcinogenicity - NTP: NO  
Carcinogenicity - IARC: NO  
Carcinogenicity - OSHA: NO  
Explanation: Carcinogenicity: NOT RELEVANT.  
Signs/Symptoms Of Overexp: SEE HEALTH HAZARDS.  
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.  
Emergency-First Aid Proc: INHAL: IF DIZZINESS OCCURS, REMOVE TO FRESH AIR  
IMMEDIATELY. INGEST: CALL MD IMMEDIATELY (FP N). EYES: IMMEDIATELY FLUSH  
W/POIABLE WATER FOR A MINIMUM OF 15 MINS. SEEK ASSISTANCE FROM MD (FP N).  
SKIN FLUSH W/COPIOUS AMOUNTS OF WATER. CALL MD (FP N).  
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Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: EVACUATE AREA. REMOVE ALL POTENTIAL SOURCES OF IGNITION. VENTILATE AREA, ESPECIALLY HIGH PLACES WHERE HYDROGEN WILL RISE & ACCUMULATE.

Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.

Waste Disposal Method: CONTACT SUPPLIER FOR DISPOSAL INSTRUCTIONS.

DISPOSAL MUST BE IN ACCORDANCE W/FEDERAL, STATE & LOCAL REGULATIONS (FP N).

Precautions-Handling/Storing: HYDROGEN MUST BE STORED AWAY FROM OXIDIZING AGENTS, E.G. OXYGEN, CHLORINE & FLUORINE. CYL STORED OUTDOORS MUST BE PROTECTED FROM EXTREMES OF WEATHER.

Other Precautions: HYDROGEN IS EXTREMELY FLAMM & MUST BE STORED IN A COOL, DRY, WELL-VENTD AREA & MUST BE PROTECTED FROM OPEN FLAMES, SPARKS & OTHER POTNTL SOURCES OF IGNIT. THAW ACCUMULATED ICE OR SNOW ON CYL AT ROOM TEMPS. NEVER USE A TORCH OR (SUP DAT)

---

Control Measures

---

Respiratory Protection: NIOSH/MSHA APPROVED OXYGEN-DEFFICIENT ATMOSPHERES ARE FLAMMABLE. DO NOT ENTER AREA.

Ventilation: MECHANICAL VENTILATION MUST COMPLY W/NEC FOR CLASS 1, GROUP B

Protective Gloves: FOR HANDLING CYLINDERS TYPE GLOVES.

Eye Protection: SAFETY GLASSES, GOGGLES AND/OR FACESHLD.

Other Protective Equipment: NONE SPECIFIED BY MANUFACTURER.

Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.

Suppl. Safety & Health Data: FIRE FIGHT PROC: DEPLETED. COOL CONTR W/WATER SPRAY BUT DO NOT EXTING THE FLAMES. EXPLO HAZ: UNTIL GAS HAS DISSIPATED. FORMS EXPLOS MIX W/AIR, OXYGEN & ALL OXIDIZING AGENTS. OTHER PREC: OTHER SOURCE OF INTENSE HEAT TO THAW ICE ON A CYL. "NO SMOKING" SIGNS MUST BE POSTED IN ALL WORK & STOR AREAS. THE HYDROGEN GAS (ING 2)

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Transportation Data

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Disposal Data

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Label Data

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Label Required: YES

Technical Review Date: 04OCT93

Label Status: G

Common Name: HYDROGEN

Chronic Hazard: NO

Signal Word: DANGER!

Acute Health Hazard-Slight: X

Contact Hazard-None: X

Fire Hazard-Severe: X

Reactivity Hazard-None: X

Special Hazard Precautions: FLAMMABLE GAS. ACUTE: SIMPLE ASPHYXIAN.

CHRONIC: NONE LISTED BY MANUFACTURER.

Protect Eye: Y

Protect Skin: Y

Protect Respiratory: Y

Label Name: SCIENTIFIC GAS PRODUCTS INC

Label Street: 2330 HAMILTON BLVD

Label P.O. Box: 648

Label City: SOUTH PLAINFIELD

Label State: NJ

Label Zip Code: 07080

Label Country: US

Label Emergency Number: 201-754-7700

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URL for this nids <http://siri.org>. If you wish to change, add to, or  
delete information in this archive please send updates to [dan@siri.org](mailto:dan@siri.org).

SCIENTIFIC GAS PRODUCTS -- G1322 NITROGEN - NITROGEN, TECHNICAL  
MATERIAL SAFETY DATA SHEET

NSN: 6830005774623

Manufacturer's CAGE: 54262

Part No. Indicator: A

Part Number/Trade Name: G1322 NITROGEN

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General Information

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Item Name: NITROGEN, TECHNICAL

Company's Name: SCIENTIFIC GAS PRODUCTS INC

Company's Street: 2330 HAMILTON BLVD

Company's City: SOUTH PLAINFIELD

Company's State: NJ

Company's Country: US

Company's Zip Code: 07080-3104

Company's Emerg Ph #: 201-754-7700

Company's Info Ph #: 201-754-7700

Distributor/Vendor # 1: ALLTECH/APPLIED SCIENCE (708-948-8600)

Distributor/Vendor # 1 Cage: 4W756

Record No. For Safety Entry: 006

Tot Safety Entries This Stk#: 007

Status: SE

Date MSDS Prepared: 29MAY89

Safety Data Review Date: 26SEP91

Supply Item Manager: CX

MSDS Serial Number: BFFVK

Specification Number: BB-N-411C

Spec Type, Grade, Class: TY I<GR B;CL 1

Hazard Characteristic Code: G3

Unit Of Issue: CF

Unit Of Issue Container Qty: BULK

Type Of Container: BULK CYLINDER

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Ingredients/Identity Information

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Proprietary: NO

Ingredient: NITROGEN

Ingredient Sequence Number: 01

Percent: 99.5

NIOSH (RTECS) Number: QW9700000

CAS Number: 7727-37-9

OSHA PEL: NOT ESTABLISHED

ACGIH TLV: ASPHYXIAN; 9192

Other Recommended Limit: NONE SPECIFIED

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Physical/Chemical Characteristics

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Appearance And Odor: COLORLESS, ODORLESS GAS.

Boiling Point: -320F-196C

Vapor Density (Air=1): 0.97

Specific Gravity: 0.808

Decomposition Temperature: UNKNOWN

Solubility In Water: 2.3 CM3/100 ML

Percent Volatiles By Volume: 100

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Fire and Explosion Hazard Data

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Flash Point: NONE

Extinguishing Media: N/R, USE ANY MEDIA FOR SURROUNDING FIRES.

Special Fire Fighting Proc: WEAR FIRE FIGHTING PROTECTIVE EQUIPMENT AND A

FULL FACED SELF CONTAINED BREATHING APPARATUS. EVACUATE AREA. COOL FIRE

EXPOSED CONTAINERS WITH WATER SPRAY.

Unusual Fire And Expl Hazrds: CONTENTS UNDER PRESSURE. CONTAINER MAY

EXPLODE IN HEAT OF FIRE.

Reactivity Data

Stability: YES

Cond To Avoid (Stability): HIGH HEAT, OPEN FLAMES.

Materials To Avoid: NONE

Hazardous Decomp Products: NITRIDES FORMED IF HEATED WITH CERTAIN METALS

Hazardous Poly Occur: NO

Conditions To Avoid (Poly): NOT APPLICABLE

Health Hazard Data

Route Of Entry - Inhalation: YES

Route Of Entry - Skin: NO

Route Of Entry - Ingestion: NO

Health Haz Acute And Chronic: NITROGEN IS A SIMPLE ASPHYXIANT. NITROGEN UNDER HIGH PRESSURE CAN PRODUCE NARCOSIS.

Carcinogenicity - NTP: NO

Carcinogenicity - IARC: NO

Carcinogenicity - OSHA: NO

Explanation Carcinogenicity: NONE OF THE CHEMICALS IN THIS PRODUCT IS LISTED BY IARC, NTP OR OSHA AS A CARCINOGEN.

Signs/Symptoms Of Overexp: INHALATION: DIZZINESS, NAUSEA, VOMITING, LOSS OF CONSCIOUSNESS, AND DEATH.

Med Cond Aggravated By Exp: NONE NOTED.

Emergency/First Aid Proc: INHALATION: REMOVE SUBJECT TO FRESH AIR. RESCUE WORKERS, WEAR SCBA. GIVE OXYGEN/CPR AS NEEDED. SEE DOCTOR.

Precautions for Safe Handling and Use

Steps If Mail Released/Spill: VENTILATE ENCLOSED AREAS TO PREVENT FORMATION OF OXYGEN-DEFICIENT ATMOSPHERES CAUSED BY THE RELEASE OF GASEOUS NITROGEN.

Neutralizing Agent: NONE APPLICABLE FOR THIS MATERIAL

Waste Disposal Method: VENT NITROGEN GAS SLOWLY TO A WELL VENTILATED OUTDOOR LOCATION REMOTE FROM WORK AREAS. DO NOT DISPOSE OF RESIDUAL NITROGEN IN CYLINDERS. RETURN TO MANUFACTURER WITH RESIDUAL PRESSURE, VALVE TIGHTLY CLOSED, AND VALVE CAPS IN PLACE.

Precautions-Handling/Storing: USE ONLY IN WELL VENTILATED AREAS. CONTAINS NITROGEN AT EXTREMELY HIGH PRESSURE. HANDLE WITH CARE.

Other Precautions: AVOID DRAGGING, ROLLING OR SLIDING CYLINDERS. USE HAND TRUCK. STORE OUTSIDE. KEEP AWAY FROM HEAT, FLAMES. KEEP AWAY FROM HEAVY TRAFFIC AREAS. AVOID EXPOSURE TO SALT OR OTHER CORROSIVE CHEMICALS. REPLACE CAP WHEN NOT IN USE.

Control Measures

Respiratory Protection: USE SCBA IN OXYGEN-DEFICIENT ATMOSPHERES. CAUTION! RESPIRATORS WILL NOT FUNCTION. USE MAY RESULT IN ASPHYXIATION.

Ventilation: MECHANICAL (GENERAL) VENTILATION AND/OR LOCAL EXHAUST AS NECESSARY.

Protective Gloves: LEATHER WORK GLOVES.

Eye Protection: SAFETY GLASSES.

Other Protective Equipment: OXYGEN MONITORING EQUIPMENT TO TEST FOR OXYGEN DEFICIENT ATMOSPHERES.

Work Hygiene Practices: STANDARD HYGENIC PRACTICES.

Suppl. Safety & Health Data: NITROGEN IS STORED IN CYLINDERS AT HIGH PRESSURES (2000+ PSIG). MAKE SURE PRESSURE EQUIPMENT AND PROCESS LINES HAVE BEEN DESIGNED TO HANDLE SUCH PRESSURES.

Transportation Data

Trans Data Review Date: 88053



DOT PSN Code: KLZ  
DOT Proper Shipping Name: NITROGEN, COMPRESSED  
DOT Class: 2.2  
DOT ID Number: UN1066  
DOT Label: NONFLAMMABLE GAS  
IMO PSN Code: KSR  
IMO Proper Shipping Name: NITROGEN, COMPRESSED  
IMO Regulations Page Number: 2163  
IMO UN Number: 1066  
IMO UN Class: 2(2.2)  
IMO Subsidiary Risk Label: -  
IATA PSN Code: SBP  
IATA UN ID Number: 1066  
IATA Proper Shipping Name: NITROGEN, COMPRESSED  
IATA UN Class: 2.2  
IATA Label: NON-FLAMMABLE GAS  
AFI PSN Code: SBP  
AFI Prop. Shipping Name: NITROGEN, COMPRESSED  
AFI Class: 2.2  
AFI ID Number: UN1066  
AFI Label: NON-FLAMMABLE GAS  
AFI Basic Pac Ref: 6-6,6-10

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Disposal Data

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Disposal Data Review Date: 88320  
Rec # For This Disp Entry: 02  
Tot Disp Entries Per NSN: 002  
Landfill Ban Item: YES  
Disposal Supplemental Data: MSDS DATED: NOVEMBER 25, 1985. IN CASE OF  
ACCIDENTAL EXPOSURE OR DISCHARGE, CONSULT HEALTH AND SAFETY FILE FOR  
PRECAUTIONS  
1st EPA Haz Wst Name New: NOT REGULATED  
1st EPA Haz Wst Char New: NOT REGULATED BY RCRA  
1st EPA Acute Hazard New: NO

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Label Data

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Label Required: YES  
Technical Review Date: 26SEP91  
Label Status: F  
Common Name: G1322 NITROGEN  
Chronic Hazard: NO  
Signal Word: WARNING!  
Acute Health Hazard-Moderate: X  
Contact Hazard-None: X  
Fire Hazard-None: X  
Reactivity Hazard-None: X  
Special Hazard Precautions: NITROGEN IS A SIMPLE ASPHYXIANT. NITROGEN  
UNDER HIGH PRESSURE CAN PRODUCE NARCOSIS. USE ONLY IN WELL VENTILATED  
AREAS. CONTAINS NITROGEN AT EXTREMELY HIGH PRESSURE. HANDLE WITH CARE.  
FIRST AID: INHALATION: REMOVE SUBJECT TO FRESH AIR. RESCUE WORKERS, WEAR  
SCBA. GIVE OXYGEN/CPR AS NEEDED. SEE DOCTOR.  
Protect Eye: Y  
Label Name: ALLTECH/APPLIED SCIENCE  
Label Street: 2701 CAROLEAN INDUSTRIAL DR  
Label P.O. Box: 440  
Label City: STATE COLLEGE  
Label State: PA  
Label Zip Code: 16801  
Label Country: US  
Label Emergency Number: 708-948-8600/814-238-2406  
Year Procured: 1991

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**AIRGAS -- OXYGEN; OXYGEN COMPRESSED - OXYGEN, TECHNICAL  
MATERIAL SAFETY DATA SHEET**

NSN: 6830007657562

Manufacturer's CAGE: 0DHP5

Part No. Indicator: A

Part Number/Trade Name: OXYGEN; OXYGEN COMPRESSED

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**General Information**

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Item Name: OXYGEN, TECHNICAL

Company's Name: AIRGAS

Company's Street: 100 MATSONFORD ROAD

Company's City: RADNOR

Company's State: PA

Company's Country: US

Company's Zip Code: 19087

Company's Emerg Ph #: 215-687-5253

Company's Info Ph #: 215-687-5253

Record No. For Safety Entry: 001

Tot Safety Entries This Sdk#: 001

Status: SM

Date MSDS Prepared: 01MAY90

Safety Data Review Date: 01MAR96

Supply Item Manager: GSA

MSDS Serial Number: BVBFX

Specification Number: BB-O-925

Spec Type, Grade, Class: TYPE 1

Hazard Characteristic Code: G4

Unit Of Issue: CY

Unit Of Issue Container Qty: 250 CF CY

Type Of Container: METAL

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**Ingredients/Identity Information**

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Proprietary: NO

Ingredient: OXYGEN

Ingredient Sequence Number: 01

NIOSH (RTECS) Number: RS2060000

CAS Number: 7782-44-7

OSHA PEL: NOT ESTABLISHED

ACGIH TLV: NOT ESTABLISHED

Other Recommended Limit: NONE RECOMMENDED

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**Physical/Chemical Characteristics**

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Appearance And Odor: COLORLESS, ODORLESS GAS

Boiling Point: -297F, -183C

Melting Point: -362F, -219C

Vapor Pressure (MM Hg/70 F): >-181F

Vapor Density (Air=1): \*

Specific Gravity: 1.11 (AIR=1)

Solubility In Water: SLIGHT

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**Fire and Explosion Hazard Data**

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Extinguishing Media: COPIOUS QUANTITIES OF WATER FOR FIRES WITH OXYGEN AS THE OXIDIZER.

Special Fire Fighting Proc: IF POSSIBLE, STOP THE FLOW OF OXYGEN WHICH IS SUPPORTING THE FIRE. \* 0.0828 LB/FT3.

Unusual Fire And Expl Hazrds: VIGOROUSLY ACCELERATES COMBUSTION. IF CYLINDERS ARE INVOLVED IN A FIRE, SAFELY RELOCATE OR KEEP COOL WITH WATER SPRAY.

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**Reactivity Data**

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Stability: YES  
Materials To Avoid: ALL FLAMMABLE MATERIALS.  
Hazardous Decomp Products: NONE  
Hazardous Poly Occur: NO

#### Health Hazard Data

Health Haz Acute And Chronic: THE PROPERTY IS THAT OF HYPEROXIA, WHICH LEADS TO PNEUMONIA. CONCENTRATIONS BETWEEN 25 & 75 MOLAR PERCENT PRESENT A RISK OF INFLAMMATION OF ORGANIC MATTER IN THE BODY

Carcinogenicity - NTP: NO

Carcinogenicity - IARC: NO

Carcinogenicity - OSHA: NO

Signs/Symptoms Of Overexp: BREATHING HIGH CONCENTRATIONS (>75 MOLAR PERCENT) CAUSES SYMPTOMS OF HYPEROXIA WHICH INCLUDES CRAMPS, NAUSEA, DIZZINESS, HYPOTHERMIA, AMBLYOPIA, RESPIRATORY DIFFICULTIES, BRADYCARDIA, FAINTING SPELLS, AND CONVULSIONS CAPABLE OF LEADING TO DEATH. FOR ADDITIONAL INFORMATION, SEE COMPRESSED GAS ASSOCIATION PAMPHLET P-14  
Med Cond Aggravated By Exp: PERSONS IN ILL HEALTH WHERE SUCH ILLNESS WOULD BE AGGRAVATED BY EXPOSURE TO OXYGEN SHOULD NOT BE ALLOWED TO WORK WITH OR HANDLE THIS PRODUCT.

Emergency/First Aid Proc: PROMPT MED AID MANDATORY. BE COGNIZANT OF EXTREME FIRE HAZARD ASSOCIATED WITH OXYGEN RICH ATMOSPHERES. ASSIST CONSCIOUS PERSONS TO UNCONTAMINATED AREA AND BREATHE FRESH AIR. KEEP WARM & QUIET. INFORM DR THAT VICTIM EXPERIENCING HYPEROXIA. MOVE UNCONSCIOUS PERSON TO UNCONTAMINATED AREA & GIVE ASSISTED RESP WHEN BREATH RESTORED. TREAT AS ABOVE. CONTINUED TREATMENT SHOULD BE SYMPTOMATIC & SUPPORTIVE

#### Precautions for Safe Handling and Use

Steps If Matl Released/Spill: EVACUATE PERSONNEL FROM AFFECTED AREA. USE PROTECTIVE EQUIP. IF LEAK IN USER'S EQUIP, BE CERTAIN TO PURGE PIPING W/ INERT GAS PRIOR TO ATTEMPTING REPAIRS. IF LEAK IN CONTAINER OR CONTAINER VALVE, CONTACT YOUR CLOSEST SUPPLIER LOCATION OR CALL EMERG #.  
Waste Disposal Method: DON'T DISPOSE OF WASTE OR UNUSED QUANTITIES. RETURN IN SHIPPING CONTAINER LABELED, WITH ANY VALVE OUTLET PLUGS OR CAP SECURED & VALVE PROTECTION CAP IN PLACE TO SUPPLIER. FOR EMERG DISPOSAL ASSISTANCE, CONTACT CLOSEST SUPPLIER OR CALL EMERG PHONE #.  
Precautions-Handling/Storing: USE IN VENTED AREA. VALVE PROTECTION CAP & VALVE OUTLET THREADED PLUG MUST REMAIN IN PLACE UNLESS CNTNR SECURED W/ VALVE OUTLET PIPED TO USE POINT. \*\*  
Other Precautions: DON'T DRAG, SLIDE, ROLL CYLNR. USE HAND TRUCK TO MOVE CYLNR. USE PRESSR REDUCING REGULTR WHEN CONNECTING CYLINDER TO LOWER PRESSURE (<3000PSIG) PIPING/SYSTEM. DON'T HEAT CYLNR TO INCREASE FLOW RATE. USE CHECK VALVE OR TRAP (PREVENT BACKFLOW).

#### Control Measures

Respiratory Protection: N/R \*\*FOR ADDED HANDLING RECOMMENDATIONS, SEE COMPRESSED GAS ASSOC'S PAMPHLETS P-1, P-14 & G-4. PROTECT CYLINDER FROM PHYSICAL DAMAGE. STORE IN COOL, DRY, VENTED AREA, AWAY FROM TRAFFICKED AREA & EMERG EXITS & FLAMMABLE PRODUCTS. \*\*\*

Ventilation: TO PREVENT ACCUMULATION ABOVE 25 MOLAR PERCENT.

Protective Gloves: AS REQUIRED; ANY MATERIAL

Eye Protection: SAFETY GOGGLES OR GLASSES

Other Protective Equipment: SAFETY SHOES, SAFETY SHOWER

Work Hygienic Practices: N/K \*\*\* IGNIT TEMP OF METALS/NON METALS IN OXYGEN DECREASES W/INCREASING OXYGEN PRESSR. \*\*\*\*

Suppl. Safety & Health Data: \*\*\*\* LOW PRESSR: CARBON STEEL & LOW ALLOY STEELS. HIGH PRESSR: STAINLESS STEEL, COPPER, LEAD, SILVER, LEAD/TIN ALLOYS. GOOD GASKET: TEFLON & KEL-F FOR NONMETAL GASKETS. DON'T USE IN PNEUMATIC EQUIPMENT. ALWAYS SECURE CYLINDERS IN AN UPRIGHT POSITION BEFORE TRANSPORTING. TRANSPORT IN OPEN FLATBED OR PICK UP TYPE VEHICLES

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Transportation Data

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Trans Data Review Date: 94147  
DOT PSN Code: LEH  
DOT Proper Shipping Name: OXYGEN, COMPRESSED  
DOT Class: 2.2  
DOT ID Number: UN1072  
DOT Label: NONFLAMMABLE GAS, OXIDIZER  
IMO PSN Code: LBP  
IMO Proper Shipping Name: OXYGEN, COMPRESSED  
IMO Regulations Page Number: 2169  
IMO UN Number: 1072  
IMO UN Class: 2(2.2)  
IMO Subsidiary Risk Label: OXIDIZING AGENT  
IATA PSN Code: SWO  
IATA UN ID Number: 1072  
IATA Proper Shipping Name: OXYGEN, COMPRESSED  
IATA UN Class: 2.2  
IATA Subsidiary Risk Class: 5.1  
IATA Label: NON-FLAMMABLE GAS & OXIDIZER  
AFI PSN Code: SWO  
AFI Prop. Shipping Name: OXYGEN, COMPRESSED  
AFI Class: 2.2  
AFI ID Number: UN1072  
AFI Label: NON-FLAMMABLE GAS, OXIDIZER  
AFI Basic Pac Ref: 6-6,6-10  
MMAC Code: NK

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Disposal Data

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Label Data

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Label Required: YES  
Label Status: G  
Common Name: OXYGEN; OXYGEN COMPRESSED  
Special Hazard Precautions: THE PROPERTY IS THAT OF HYPEROXIA, WHICH LEADS TO PNEUMONIA. CONCENTRATIONS BETWEEN 25 & 75 MOLAR PERCENT PRESENT A RISK OF INFLAMMATION OF ORGANIC MATTER IN THE BODY. BREATHING HIGH CONCENTRATIONS (>75 MOLAR PERCENT) CAUSES SYMPTOMS OF HYPEROXIA WHICH INCLUDES CRAMPS, NAUSEA, DIZZINESS, HYPOTHERMIA, AMBLYOPIA, RESPIRATORY DIFFICULTIES, BRADYCARDIA, FAINTING SPELLS, AND CONVULSIONS CAPABLE OF LEADING TO DEATH. FOR ADDITIONAL INFORMATION, SEE COMPRESSED GAS ASSOCIATION PAMPHLET P-14.  
Label Name: AIRGAS  
Label Street: 100 MATSONFORD ROAD  
Label City: RADNOR  
Label State: PA  
Label Zip Code: 19087  
Label Country: US  
Label Emergency Number: 215-687-5253

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**APPENDIX F.4**  
**MSDS - MISCELLANEOUS**

## **APPENDIX F.4**

### **MSDS - MISCELLANEOUS**

The following MSDS sheets are included in alphabetical order for miscellaneous compounds which may be used during the field effort:

- Acetone pg. F.4. 2-4
- Asphalt pg. F.4. 5-7
- Concrete pg. F.4. 8-11
- Diesel Fuel pg. F.4. 12-15
- Gasoline pg. F.4. 16-20
- Grout pg. F.4. 21-24
- Hexane pg. F.4. 25-27
- Hydrosep pg. F.4. 28-30
- Isobutylene pg. F.4. 31-33
- Isopropyl Alcohol pg. F.4. 34-37
- Methanol pg. F.4. 38-41
- Zinc Acetate. pg. F.4. 42-45

CHEM SERVICE -- ACETONE, 0-798  
MATERIAL SAFETY DATA SHEET  
NSN: 681000N044686  
Manufacturer's CAGE: 8Y898  
Part No. Indicator: A  
Part Number/Trade Name: ACETONE, 0-798

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General Information

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Company's Name: CHEM SERVICE INC  
Company's P. O. Box: 3108  
Company's City: WEST CHESTER  
Company's State: PA  
Company's Country: US  
Company's Zip Code: 19381  
Company's Emerg Ph #: 215-692-3026  
Company's Info Ph #: 215-692-3026  
Record No. For Safety Entry: 001  
Tot Safety Entries This Stk#: 001  
Status: SMJ  
Date MSDS Prepared: 27AUG92  
Safety Data Review Date: 06SEP95  
MSDS Serial Number: BTWVM  
Hazard Characteristic Code: F3

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Ingredients/Identity Information

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Proprietary: NO  
Ingredient: ACETONE (SARA III). LD50:(ORAL,RAT) 5800 MG/KG.  
Ingredient Sequence Number: 01  
NIOSH (RTECS) Number: AL3150000  
CAS Number: 67-64-1  
OSHA PEL: 750PPM;1000 PPM STEL  
ACGIH TLV: 750PPM;1000 PPM STEL

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Physical/Chemical Characteristics

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Appearance And Odor: COLORLESS LIQUID; FRUITY/PLEASANT ODOR.  
Boiling Point: 133F,56C  
Melting Point: -137F,-94C  
Vapor Pressure (MM Hg/70 F): 184 @ 20C  
Vapor Density (Air=1): 2  
Specific Gravity: 0.788  
Evaporation Rate And Ref: 5.6 (BUTYL ACETATE=1)  
Solubility In Water: MISCIBLE

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Fire and Explosion Hazard Data

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Flash Point: 0F,-18C  
Lower Explosive Limit: 2.6%  
Upper Explosive Limit: 12.8%  
Extinguishing Media: CARBON DIOXIDE, DRY CHEMICAL POWDER OR SPRAY.  
Special Fire Fighting Proc: USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).  
Unusual Fire And Expl Hazrds: VAPORS MAY TRAVEL CONSIDERABLE DISTANCE TO SOURCE OF IGNITION & FLASH BACK. FLAMMABLE. VOLATILE.

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Reactivity Data

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Stability: YES  
Cond To Avoid (Stability): SENSITIVE TO HEAT.  
Materials To Avoid: INCOMPATIBLE W/STRONG ACIDS, STRONG BASES, STRONG OXIDIZING AGENTS, STRONG REDUCING AGENTS.  
Hazardous Decomp Products: DECOMPOSITION LIBERATES TOXIC FUMES.  
Hazardous Poly Occur: NO  
Conditions To Avoid (Poly): NOT RELEVANT



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Health Hazard Data

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LD50-LC50 Mixture: SEE INGREDIENT.  
Route Of Entry - Inhalation: YES  
Route Of Entry - Skin: YES  
Route Of Entry - Ingestion: YES  
Health Haz Acute And Chronic: CAN CAUSE SKIN IRRITATION. CAN BE IRRITATING TO MUCOUS MEMBRANES. CAN CAUSE EYE IRRITATION. MAY BE HARMFUL IF ABSORBED THROUGH SKIN. MAY BE HARMFUL IF INHALED. MAY BE HARMFUL IF SWALLOWED. DUST &/OR VAPORS CAN CAUSE IRRITATION TO RESPIRATORY TRACT. CAN BE IRRITATING TO MUCOUS MEMBRANES. EXPOSURE CAN (EFTS OF OVEREXP)  
Carcinogenicity - NTP: NO  
Carcinogenicity - IARC: NO  
Carcinogenicity - OSHA: NO  
Explanation Carcinogenicity: NOT RELEVANT  
Signs/Symptoms Of Overexp: HLTH HAZ:CAUSE DERMATITIS. TARGET ORGAN: LIVER & KIDNEYS, SKIN, RESPIRATORY SYSTEM.  
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.  
Emergency/First Aid Proc: INGEST:CALL MD IMMED (FP N). EYES:FLUSH CONTINUOUSLY W/WATER FOR AT LST 15-20 MINS. SKIN:FLUSH W/WATER FOR 15-20 REMOVE PATIENT TO FRESH AIR. ADMIN OXYGEN IF PATIENT IS HAVING DFCLTY BRTHG. IF PATIENT HAS STOPPED BRTHG ADMIN ARTF RESP. IF PATIENT IS IN CARDIAC ARREST ADMIN CPR. CONTINUE LIFE SUPPORTING MEASURES UNTIL(SUPDAT)

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Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROPRIATE OSHA REGULATED EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE OR SIMILAR MATERIAL. SWEEP UP & PLACE IN APPROPRIATE CONTAINER. HOLD FOR DISPOSAL. WASH CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.  
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.  
Waste Disposal Method: DISPOSAL MUST BE I/A/W FEDERAL, STATE & LOCAL REGULATIONS (FP N). BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AFTERBURNER & SCRUBBER.  
Precautions-Handling/Storing: AVOID CONTACT W/SKIN, EYES & CLOTHING. KEEP TIGHTLY CLOSED IN A COOL, DRY PLACE. STORE ONLY W/COMPATIBLE CHEMICALS.  
Other Precautions: ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS - AVOID DIRECT PHYSICAL CONTACT. THIS PRODUCT IS FURNISHED FOR LAB USE ONLY! OUR PRODS MAY NOT BE USED AS DRUGS, COSMETICS, AGRICULTURAL OR PESTICIDAL PRODS. FOOD ADDITIVES OR AS HOUSEHOLD CHEMS.

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Control Measures

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Respiratory Protection: NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N).  
Ventilation: THIS CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.  
Protective Gloves: IMPERVIOUS GLOVES (FP N).  
Eye Protection: ANSI APPRVD CHEM WORKERS GOGGLES (FP N).  
Other Protective Equipment: USE APPROPRIATE NIOSH/MSHA APPROVED SAFETY EQUIPMENT.  
Work Hygienic Practices: CONTACT LENSES SHOULD NOT BE WORN IN THE LABORATORY.  
Suppl. Safety & Health Data: FIRST AID PROC:MED ASSISTANCE HAS ARRIVED. AN ANTIDOTE IS A SUBSTANCE INTENDED TO COUNTERACT EFT OF A POIS. IT SHOULD BE ADMIN ONLY BY MD/TRAINED EMER PERS. MED ADVICE CAN BE OBTAINED FROM A POIS CTL CTR.

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Transportation Data

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Disposal Data

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Label Data

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Label Required: YES  
Technical Review Date: 02NOV93  
Label Date: 19OCT93  
Label Status: G  
Common Name: ACETONE, 0-798  
Chronic Hazard: NO  
Signal Word: DANGER!  
Acute Health Hazard-Slight: X  
Contact Hazard-Slight: X  
Fire Hazard-Severe: X  
Reactivity Hazard-None: X  
Special Hazard Precautions: EXTREMELY FLAMMABLE. ACUTE: CAN CAUSE SKIN IRRITATION. CAN BE IRRITATING TO MUCOUS MEMBRANES. CAN CAUSE EYE IRRITATION. MAY BE HARMFUL IF ABSORBED THROUGH SKIN. MAY BE HARMFUL IF INHALED. MAY BE HARMFUL IF SWALLOWED. DUST &/OR VAPORS CAN CAUSE IRRITATION TO RESPIRATORY TRACT. CAN BE IRRITATING TO MUCOUS MEMBRANES. EXPOSURE CAN CAUSE DERMATITIS. TARGET ORGANS: LIVER, KIDNEYS, SKIN, RESPIRATORY SYSTEM. CHRONIC: NONE LISTED BY MANUFACTURER.  
Protect Eye: Y  
Protect Skin: Y  
Protect Respiratory: Y  
Label Name: CHEM SERVICE  
Label P.O. Box: 3108  
Label City: WEST CHESTER  
Label State: PA  
Label Zip Code: 19381  
Label Country: US  
Label Emergency Number: 215-692-3026

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URL for this msds <http://siri.org>. If you wish to change, add to, or delete information in this archive please send updates to [dan@siri.org](mailto:dan@siri.org).

ORLANDO PAVING - HOT MIX ASPHALT  
MATERIAL SAFETY DATA SHEET  
NSN: 561000N063891  
Manufacturer's CAGE: 0C2H6  
Part No. Indicator: A  
Part Number/Trade Name: HOT MIX ASPHALT

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General Information

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Company's Name: ORLANDO PAVING CO  
Company's P. O. Box: 547186  
Company's City: ORLANDO  
Company's State: FL  
Company's Country: US  
Company's Zip Code: 32854-7186  
Company's Emerg Ph #: 305-740-5779  
Company's Info Ph #: 305-740-5779  
Record No. For Safety Entry: 001  
Tot Safety Entries This Stk#: 001  
Status: SMJ  
Date MSDS Prepared: 01OCT93  
Safety Data Review Date: 18SEP95  
MSDS Serial Number: BZJWB

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Ingredients/Identity Information

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Proprietary: NO  
Ingredient: ASPHALT; (ASPHALT CEMENT)  
Ingredient Sequence Number: 01  
Percent: 5.0-8.5  
NIOSH (RTECS) Number: CI9900000  
CAS Number: 8052-42-4  
OSHA PEL: N/K (FP N)  
ACGIH TLV: N/K (FP N)

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Proprietary: NO  
Ingredient: ANTISTRIPPING AGENT  
Ingredient Sequence Number: 02  
Percent: 0-0.03  
NIOSH (RTECS) Number: 1012519AS  
OSHA PEL: N/K (FP N)  
ACGIH TLV: N/K (FP N)

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Physical/Chemical Characteristics

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Appearance And Odor: TRACE ODORS.  
Specific Gravity: 2.3+  
Evaporation Rate And Ref: N/A  
Solubility In Water: INSOLUBLE  
Percent Volatiles By Volume: NEGLIG

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Fire and Explosion Hazard Data

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Flash Point: 605F,318C  
Flash Point Method: COC  
Extinguishing Media: DRY CHEMICAL (ASPHALT CEMENT).  
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED SCBA & FULL  
PROTECTIVE EQUIPMENT(FP N).  
Unusual Fire And Expl Hazrds: RELEASES OF HAZARDOUS GASES: POLYNUCLEAR  
AROMATIC HYDROCARBONS, ALKYL & NAPHTHENE AROMATICS, OCCASIONAL SULFUR,  
NITROGEN. OTHER MATLS AS TRACE ELEMENTS.

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Reactivity Data

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Stability: YES  
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.

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Materials To Avoid: NONE SPECIFIED BY MANUFACTURER.  
Hazardous Decomp Products: NONE SPECIFIED BY MANUFACTURER.  
Hazardous Poly Occur: NO  
Conditions To Avoid (Poly): NOT RELEVANT.

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Health Hazard Data

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LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.  
Route Of Entry - Inhalation: NO  
Route Of Entry - Skin: YES  
Route Of Entry - Ingestion: NO  
Health Haz Acute And Chronic: MILD TO SERIOUS BURNS. CHRONIC: POSSIBLE CARCINOGENS.  
Carcinogenicity - NTP: NO  
Carcinogenicity - IARC: NO  
Carcinogenicity - OSHA: NO  
Explanation Carcinogenicity: NOT RELEVANT.  
Signs/Symptoms Of Overexp: SEE HEALTH HAZARDS.  
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.  
Emergency/First Aid Proc: SKIN: COOL W/COOL OR ICE WATER; SERIOUS BURNS TO VENILATE W/FRESH AIR. EYES: FLUSH W/WATER/EYE WASH COMPOUND FOR AT LEAST 15 MINUTES. SEE MD(FP N).

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Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: NONE SPECIFIED BY MANUFACTURER.  
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.  
Waste Disposal Method: DISPOSE OF IN ACCORDANCE W/LOCAL, STATE & FEDERAL REGULATIONS(FP N).  
Precautions-Handling/Storing: NONE SPECIFIED BY MANUFACTURER.  
Other Precautions: NONE SPECIFIED BY MANUFACTURER.

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Control Measures

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Respiratory Protection: USE NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN(FP N).  
Ventilation: NONE SPECIFIED BY MANUFACTURER.  
Protective Gloves: IMPERVIOUS GLOVES(FP N).  
Eye Protection: ANSI APPRVD CHEM WORKERS GOGGS(FP N).  
Other Protective Equipment: EMERGENCY EYEWASH & DELUGE SHOWER MEETING ANSI DESIGN CRITERIA(FP N).  
Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.  
Suppl. Safety & Health Data: NONE SPECIFIED BY MANUFACTURER.

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Transportation Data

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Disposal Data

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Label Data

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Label Required: YES  
Technical Review Date: 18SEP95  
Label Date: 18SEP95  
Label Status: B  
Common Name: HOT MIX ASPHALT  
Chronic Hazard: NO  
POSSIBLE CARCINOGENS.  
Protect Eye: X  
Protect Skin: X  
Protect Respiratory: X  
Label Name: ORLANDO PAVING CO  
Label P O. Box: 547186  
Label City: ORLANDO  
Label State: FL

Label Zip Code: 32845-7186  
Label Country: US  
Label Emergency Number: 305-740-5779

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QUIKRETE COMPANIES - CONCRETE MIX, 1101  
MATERIAL SAFETY DATA SHEET  
NSN: 561000N034924  
Manufacturer's CAGE: 4B264  
Part No. Indicator: A  
Part Number/Trade Name: CONCRETE MIX, 1101

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General Information

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Company's Name: QUIKRETE COMPANIES  
Company's Street: 1790 CENTURY CIR  
Company's City: ATLANTA  
Company's State: GA  
Company's Country: US  
Company's Zip Code: 30345  
Company's Emerg Ph #: 404-634-9100  
Company's Info Ph #: 404-634-9100  
Record No. For Safety Entry: 001  
Tot Safety Entries This Sdk#: 001  
Status: SMJ  
Date MSDS Prepared: 01FEB93  
Safety Data Review Date: 15JUN95  
MSDS Serial Number: BQFRH  
Hazard Characteristic Code: N1

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Ingredients/Identity Information

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Proprietary: NO  
Ingredient: SILICATE, PORTLAND CEMENT  
Ingredient Sequence Number: 01  
NIOSH (RTECS) Number: VV8770000  
CAS Number: 65997-15-1  
OSHA PEL: 50 MPPCF  
ACGIH TLV: 10 MG/M3 TDUST

Proprietary: NO  
Ingredient: SILICA, CRYSTALLINE - QUARTZ  
Ingredient Sequence Number: 02  
NIOSH (RTECS) Number: VV7330000  
CAS Number: 14808-60-7  
OSHA PEL: N/K (FP N)  
ACGIH TLV: 0.1 MG/M3 RDUST

Proprietary: NO  
Ingredient: CALCIUM CARBONATE; (NATURAL SAND, GRAVEL, LIMESTONE OR DOLOMITE)  
Ingredient Sequence Number: 03  
NIOSH (RTECS) Number: EV9580000  
CAS Number: 1317-65-5  
OSHA PEL: 5 MG/M3 (MFR)  
ACGIH TLV: 5 MG/M3 (MFR)

Proprietary: NO  
Ingredient: OTHER PREC: CONTACT. PRECS MUST BE OBSERVED AS BURNS OCCUR W/  
LITTLE WARNING--LITTLE HEAT IS SENSED.  
Ingredient Sequence Number: 04  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

Proprietary: NO  
Ingredient: EYE PROT: & FULL LENGTH FACESHIELD (FP N).  
Ingredient Sequence Number: 05  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

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Physical/Chemical Characteristics

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Appearance And Odor: GRAY COLORED WITH NO ODOR.  
Boiling Point: N/A  
Melting Point: N/A  
Vapor Pressure (MM Hg/70 F): N/A  
Vapor Density (Air=1): N/A  
Specific Gravity: N/A  
Evaporation Rate And Ref: N/A  
Solubility In Water: SLIGHT

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Fire and Explosion Hazard Data

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Flash Point: NONCOMBUSTIBLE  
Extinguishing Media: MEDIA SUITABLE FOR SURROUNDING FIRE (FP N).  
Special Fire Fighting Proc: USE NIOSH/MSHA APPROVED SCBA AND FULL  
PROTECTIVE EQUIPMENT (FP N).  
Unusual Fire And Expl Hazrds: NONCOMBUSTIBLE AND NOT EXPLOSIVE.

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Reactivity Data

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Stability: YES  
Cond To Avoid (Stability): KEEP DRY UNTIL USED TO PRESERVE PRODUCT  
UTILITY.  
Materials To Avoid: IT IS NOT INCOMPAT W/MOST OTHER MATLS, BUT SILICA WILL  
DISSOLVE IN HYDROFLUORIC ACID & PRDCE CORR GAS--SILICON (SUPDAT)  
Hazardous Decomp Products: SILICA WILL DISSOLVE IN HYDROFLUORIC ACID &  
PRODUCE A CORROSIVE GAS-SILICON TETRAFLUORIDE.  
Hazardous Poly Occur: NO  
Conditions To Avoid (Poly): NOT RELEVANT.

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Health Hazard Data

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LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.  
Route Of Entry - Inhalation: YES  
Route Of Entry - Skin: YES  
Route Of Entry - Ingestion: YES  
Health Haz Acute And Chronic: EXPOSURE CAN AFFECT THE SKIN, EYES AND  
MUCOUS MEMBRANES. CONTAINS SILICA PARTICLES THAT MAY BE BROKEN DOWN TO THE  
RESPIRABLE DUST SIZE RANGE DURING SHIPPING, HANDLING, OR USE AND THUS MAY  
BE INHALED. ACUTE: CAN DRY SKIN & CAUSE ALKALI BURNS. DUST CAN IRRITATE EYES  
& UPPER RESP SYS. TOX EFTS NOTED IN (EFTS OF OVEREXP)  
Carcinogenicity - NTP: YES  
Carcinogenicity - IARC: YES  
Carcinogenicity - OSHA: NO  
Explanation Carcinogenicity: SILICA, CRYSTALLINE QUARTZ: ANTICIPATED TO BE  
A CARCINOGEN (NTP), GROUP 2A (IARC).  
Signs/Symptoms Of Overexp: HLTH HAZ: ANIMALS INCLUDE, FOR ACUTE EXPOS,  
ALVEOLAR DAMAGE W/PULM EDEMA. CHRONIC: DUST CAN CAUSE INFLAMM OF LINING TISS  
OF INTERIOR OF NOSE & INFLAMM OF CORNEA. HYPERSENSITIVE INDIV MAY DEVELOP  
ALLERG DERM. EXCESS INHAL OF SILICA DUST MAY RESULT IN RESP DISEASE, INCL  
SILICOSIS, PNEUMOCONIOSIS, PULM FIBROSIS & (SUPP DATA)  
Med Cond Aggravated By Exp: INDIVIDUALS WITH SENSITIVE SKIN AND WITH  
PULMONARY AND/OR RESPIRATORY DISEASE, INCLUDING, BUT NOT LIMITED TO, ASTHMA  
& BRONCHITIS, OR SUBJECT TO EYE IRRITATION, SHOULD BE PRECLUDED FROM  
EXPOSURE.  
Emergency/First Aid Proc: EYE: IRRIGATE IMMEDIATELY AND REPEATEDLY WITH  
CLEAN WATER FOR AT LEAST 15 MINUTES. SKIN: WASH EXPOSED AREAS WITH SOAP &  
WATER. APPLY STERILE DRESSINGS. INHAL: REMOVE PERSON IMMEDIATELY TO FRESH  
AIR, GIVE ARTIFICIAL RESPIRATION AS NEEDED. GET MD. INGEST: CALL MD  
IMMEDIATELY (FP N).

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Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: USE DUSTLESS METHODS (VACUUM) AND PLACE INTO

---

CLOSABLE CONTAINER OR DISPOSAL OR USE IF NOT CONTAMINATED OR WET. USE ADEQUATE VENTILATION.

Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.

Waste Disposal Method: CAN BE TREATED AS COMMON WASTE FOR DISPOSAL IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.

Precautions-Handling/Storing: PRECAUTIONS MUST BE OBSERVED BECAUSE BURNS OCCUR WITH LITTLE WARNING-LITTLE HEAT IS SENSED.

Other Precautions: NONE SPECIFIED BY MANUFACTURER.

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#### Control Measures

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Respiratory Protection: IN DUST ENVIRONMENTS, THE USE OF A NIOSH/MSHA APPROVED RESPIRATOR IS RECOMMENDED.

Ventilation: LOCAL EXHAUST CAN BE USED, IF NECESSARY, TO CONTROL AIRBORNE DUST LEVELS.

Protective Gloves: IMPERVIOUS GLOVES.

Eye Protection: CHEMICAL WORKERS GOGGLES (FP N).

Other Protective Equipment: BARRIER CREAMS, IMPERVIOUS BOOTS AND CLOTHING. EMERGENCY EYE BATH AND DELUGE SHOWER (FP N).

Work Hygienic Practices: FOLLOWING WORK, WORKERS SHOULD SHOWER WITH SOAP & WATER.

Suppl. Safety & Health Data: MATLS TO AVOID:DIFLUORIDE MAY CAUSE FIRES.

EFTS OF OVEREXP:POSSIBLY CANCER. SYMPTOMS OF EXCESSIVE EXPOSURE INCLUDE SHORTNESS OF BREATH AND REDUCED PULMONARY FUNCTION. THIS INERT MATERIAL GIVES NO POTENTIAL ACUTE TOXIC HAZARD.

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#### Transportation Data

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Trans Data Review Date: 93104

DOT PSN Code: ZZZ

DOT Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION

IMO PSN Code: ZZZ

IMO Proper Shipping Name: NOT REGULATED FOR THIS MODE OF TRANSPORTATION

IATA PSN Code: ZZZ

IATA Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION

AFI PSN Code: ZZZ

AFI Prop. Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION

Additional Trans Data: NOT REGULATED FOR TRANSPORTATION

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#### Disposal Data

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#### Label Data

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Label Required: YES

Technical Review Date: 15JUN95

Label Date: 15JUN95

Label Status: B

Common Name: CONCRETE MIX, 1101

Chronic Hazard: YES

Signal Word: WARNING!

Acute Health Hazard-Slight: X

Contact Hazard-Moderate: X

Fire Hazard-None: X

Reactivity Hazard-None: X

Special Hazard Precautions: MAY PRODUCE CORROSIVE GASES. ACUTE: CAN DRY SKIN & CAUSE ALKALI BURNS. DUST CAN IRRITATE EYES & UPPER RESPIRATORY SYSTEM. TOXIC EFCFTS IN ANIMALS INCLUDE, ALVEOLAR DAMAGE WITH PULMONARY EDEMA. SYMPTOMS INCLUDE SHORTNESS OF BREATH & REDUCED PULMONARY FUNCTION. CHRONIC: CANCER HAZARD. CONTAINS CRYSTALLINE SILICA-QUARTZ WHICH IS LISTED AS A LUNG CARCINOGEN (FP N). DUST CAN CAUSE INFLAMMATION OF LINING TISSUE OF INTERIOR OF NOSE & INFLAMMATION OF THE CORNEA. ALLERGIC DERMATITIS IN HYPERSENSITIVE PERSONS. INHALATION OF SILICA DUST MAY RESULT IN RESPIRATORY DISEASE, INCLUDING SILICOSIS, PNEUMOCONIOSIS, PULMONARY FIBROSIS.

Protect Eye: X

Protect Skin: X



Protect Respiratory: X  
Label Name: QUIKRETE COMPANIES  
Label Street: 1790 CENTURY CIR  
Label City: ATLANTA  
Label State: GA  
Label Zip Code: 30345  
Label Country: US  
Label Emergency Number: 404-634-9100

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MOBIL -- DIESEL FUELS - DIESEL FUEL  
MATERIAL SAFETY DATA SHEET  
NSN: 9140002865282  
Manufacturer's CAGE: 57635  
Part No. Indicator: A  
Part Number/Trade Name: DIESEL FUELS

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General Information

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Item Name: DIESEL FUEL  
Company's Name: MOBIL CORP  
Company's Street: 150 E 42ND ST  
Company's City: NEW YORK  
Company's State: NY  
Company's Country: US  
Company's Zip Code: 10017-5612  
Company's Emerg Ph #: 609-737-4411 / 800-424-9300CHEMTREC  
Company's Info Ph #: 800-662-4525  
Distributor/Vendor # 1: MOBIL OIL CORPORATION  
Distributor/Vendor # 1 Cage: 3V728  
Record No. For Safety Entry: 004  
Tot Safety Entries This Std#: 004  
Status: SE  
Date MSDS Prepared: 12SEP90  
Safety Data Review Date: 28MAR95  
Supply Item Manager: KY  
MSDS Preparer's Name: ENVIRONMENTAL HEALTH & SA  
Preparer's Company: MOBIL OIL CORPORATION  
Preparer's City: PRINCETON  
Preparer's State: NJ  
MSDS Serial Number: BPMFB  
Specification Number: VV-F-800  
Spec Type, Grade, Class: GRADE DF-A  
Hazard Characteristic Code: F4  
Unit Of Issue: DR  
Unit Of Issue Container Qty: 5 GALLONS  
Type Of Container: DRUM  
Net Unit Weight: 35.4 LBS

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Ingredients/Identity Information

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Proprietary: NO  
Ingredient: DIESEL FUEL  
Ingredient Sequence Number: 01  
Percent: 100  
NIOSH (RTECS) Number: HZ1800000  
CAS Number: 68334-30-5  
OSHA PEL: NOT ESTABLISHED  
ACGIH TLV: NOT ESTABLISHED  
Other Recommended Limit: NONE RECOMMENDED

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Physical/Chemical Characteristics

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Appearance And Odor: CLEAR TO AMBER LIQUID; HYDROCARBON ODOR  
Boiling Point: 350F,177C  
Melting Point: UNKNOWN  
Vapor Pressure (MM Hg/70 F): 0.5 MM HG  
Vapor Density (Air=1): UNKNOWN  
Specific Gravity: 0.82-0.87  
Decomposition Temperature: UNKNOWN  
Evaporation Rate And Ref: UNKNOWN  
Solubility In Water: UNKNOWN  
Viscosity: 1.3-4.1 CST  
Corrosion Rate (IPY): UNKNOWN

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Fire and Explosion Hazard Data

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Flash Point: >100F,>38C  
Flash Point Method: PMCC  
Lower Explosive Limit: UNKNOWN  
Upper Explosive Limit: UNKNOWN  
Extinguishing Media: WATER FOG, CARBON DIOXIDE, DRY CHEMICAL, FOAM.  
Special Fire Fighting Proc: FIREFIGHTERS SHOULD WEAR FULL PROTECTIVE CLOTHING INCLUDING SELF-CONTAINED BREATHING APPARATUS. USE WATER TO COOL FIRE EXPOSED CONTAINERS. CONTAIN RUNOFF.  
Unusual Fire And Expl Hazrds: MATERIAL IS COMBUSTIBLE.

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#### Reactivity Data

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Stability: YES  
Cond To Avoid (Stability): HEAT, SPRAYS, FLAME, AND BUILD-UP OF STATIC ELECTRICITY. DLA-HMIS: AVOID CONTACT WITH INCOMPATIBLE MATERIALS.  
Materials To Avoid: HALOGENS, STRONG ACIDS, ALKALIS AND OXIDIZERS.  
Hazardous Decomp Products: CARBON MONOXIDE FROM INCOMPLETE COMBUSTION.  
Hazardous Poly Occur: NO  
Conditions To Avoid (Poly): WILL NOT OCCUR.

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#### Health Hazard Data

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LD50-LC50 Mixture: ORAL LD50 (RAT) IS UNKNOWN  
Route Of Entry - Inhalation: YES  
Route Of Entry - Skin: YES  
Route Of Entry - Ingestion: YES  
Health Haz Acute And Chronic: ACUTE: HARMFUL IF IN CONTACT WITH OR ABSORBED THROUGH THE SKIN. CONTACT MAY CAUSE SKIN AND EYE IRRITATION. PROLONGED OR REPEATED EXPOSURE MAY CAUSE LIVER OR BLOOD-FORMING ORGAN DAMAGE, EFFECT THE UNBORN. MAY CAUSE SKIN IRRITATION OR DERMATITIS.  
Carcinogenicity - NTP: NO  
Carcinogenicity - IARC: NO  
Carcinogenicity - OSHA: NO  
Explanation Carcinogenicity: PER MANUFACTURER'S MSDS-ANIMAL STUDIES SHOW DIESEL EXHAUST HAS THE POTENTIAL FOR LUNG CANCER.  
RESPIRATORY IRRITATION, DIZZINESS, NAUSEA, LOSS OF CONSCIOUSNESS.  
INGESTION-NONE SPECIFIED BY MANUFACTURER.  
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.  
Emergency/First Aid Proc: EYES-FLUSH WITH WATER. GET MEDICAL ASSISTANCE.  
SKIN-DRY WIPE. WASH WITH WATERLESS CLEANER, FOLLOWED BY SOAP & WATER.  
REMOVE CONTAMINATED CLOTHES & SHOES. INHALED-REMOVE FROM EXPOSURE. IF UNCONSCIOUSNESS OCCURS, SEEK IMMEDIATE MEDICAL ASSISTANCE. IF BREATHING STOPPED, GIVE ARTIFICIAL RESPIRATION. INGESTED-DO NOT INDUCE VOMITING! IF CONSCIOUS, GIVE 1-2 GLASSES OF WATER. GET IMMEDIATE MEDICAL HELP.

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#### Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: ABSORB ON FIRE RETARDANT TREATED SAWDUST, DIATOMACEOUS EARTH, ETC. SHOVEL UP AND DISPOSE OF IN ACCORDANCE WITH CURRENT LOCAL, STATE AND FEDERAL REGULATIONS. REPORT SPILLS AS REQUIRED TO PROPER AUTHORITIES. IF AFFECTS WATERWAYS-CALL 800-424-8802.  
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.  
Waste Disposal Method: PRODUCT IS SUITABLE FOR BURNING AS FUEL VALUE IN COMPLIANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS. EPA/RCRA HAZARDOUS WASTE NUMBER D001 (IGNITABLE) (FLASHPOINT <140F) MAY APPLY TO UNUSED/UNCONTAMINATED PRODUCT.  
Precautions-Handling/Storing: STORE IN A COOL, DRY PLACE AWAY FROM SOURCES OF IGNITION AND INCOMPATIBLE MATERIALS. AVOID ALL PERSONAL CONTACT AND BREATHING MISTS/VAPORS.  
Other Precautions: FLAMMABLE ATMOSPHERE CAN BE PRODUCED IN TANKS. GROUND & BOND ALL TRANSFER EQUIPMENT. STORED MATERIAL MUST BE LABELED AS COMBUSTIBLE.

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#### Control Measures

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Respiratory Protection: NO SPECIAL REQUIREMENTS UNDER NORMAL CONDITIONS OF USE AND WITH ADEQUATE VENTILATION.

Ventilation: VENTILATION DESIRABLE AND EQUIPMENT MUST BE EXPLOSION-PROOF. USE IN WELL-VENTILATED AREA.

Protective Gloves: IMPERVIOUS-NITRILE, PVA.

Eye Protection: CHEMICAL GOGGLES FOR SPLASH PROTECTION.

Other Protective Equipment: NONE SPECIFIED BY MANUFACTURER. DLA-HMIS: EYE

WASH STATION & SAFETY SHOWER AVAILABLE FOR EMERGENCIES.

Work Hygienic Practices: WASH HANDS AFTER USE AND BEFORE EATING, DRINKING, OR SMOKING. LAUNDRY CONTAMINATED CLOTHES BEFORE REUSE.

Suppl. Safety & Health Data: ENVIRONMENTAL DATA: SARA 311/312-FIRE,

CHRONIC, ACUTE; SARA 313: NONE. TSCA-ALL. NOTE: THIS PRODUCT CONTAINS

AROMATIC OILS WHICH CONTAIN POLYCYCLIC AROMATIC HYDROCARBONS (PCAH). UNDER CONDITIONS OF POOR PERSONAL HYGIENE SOME PCAH MAY CAUSE HUMAN SKIN CANCER.

MD'S NOTE: ASPIRATED PRODUCT MAY CAUSE CHEMICAL PNEUMONITIS.

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#### Transportation Data

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Trans Data Review Date: 95087

DOT PSN Code: EXF

DOT Symbol: D

DOT Proper Shipping Name: DIESEL FUEL

DOT Class: 3

DOT ID Number: NA1993

DOT Pack Group: III

DOT Label: NONE

IMO PSN Code: HRR

IMO Proper Shipping Name: GAS OIL

IMO Regulations Page Number: 3375

IMO UN Number: 1202

IMO UN Class: 3.3

IMO Subsidiary Risk Label: -

IATA PSN Code: MTX

IATA UN ID Number: 1202

IATA Proper Shipping Name: GAS OIL

IATA UN Class: 3

IATA Label: FLAMMABLE LIQUID

AFI PSN Code: MTX

AFI Prop. Shipping Name: GAS OIL

AFI Class: 3

AFI ID Number: UN1202

AFI Pack Group: III

AFI Label: FLAMMABLE LIQUID

AFI Basic Pac Ref: 7-7

Additional Trans Data: DOT PSN IS PER MANUFACTURER'S MSDS.

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#### Disposal Data

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#### Label Data

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Label Required: YES

Technical Review Date: 28MAR95

Label Status: G

Common Name: DIESEL FUELS

Chronic Hazard: YES

Signal Word: WARNING!

Acute Health Hazard-Slight: X

Contact Hazard-Slight: X

Fire Hazard-Moderate: X

Reactivity Hazard-None: X

Special Hazard Precautions: COMBUSTIBLE! HARMFUL IF IN CONTACT WITH OR ABSORBED THROUGH SKIN. PROLONGED SKIN CONTACT HAS CAUSED TOXIC EFFECTS IN LAB ANIMALS INCLUDING SKIN CANCER, LIVER DAMAGE, BLOOD EFFECTS & EFFECTS ON THE UNBORN. TARGET ORGANS: SKIN, BLOOD-FORMING ORGANS, LIVER. FIRST AID: EYES-FLUSH WITH WATER. GET MEDICAL ASSISTANCE. SKIN-DRY WIPE. WASH WITH WATERLESS

CLEANER,FOLLOWED BY SOAP & WATER.REMOVE CONTAMINATED CLOTHES & SHOES.  
INHALED-REMOVE FROM EXPOSURE.IF UNCONSCIOUSNESS OCCURS,SEEK IMMEDIATE  
MEDICAL ASSISTANCE.IF BREATHING STOPPED,GIVE ARTIFICIAL RESPIRATION.  
INGESTED-DO NOT INDUCE VOMITING!IF CONSCIOUS,GIVE 1-2 GLASSES OF WATER.GET  
IMMEDIATE MEDICAL HELP.

Protect Eye: Y

Protect Skin: Y

Protect Respiratory: Y

Label Name: MOBIL CORP

Label Street: 150 E 42ND ST

Label City: NEW YORK

Label State: NY

Label Zip Code: 10017-5612

Label Country: US

Label Emergency Number: 609-737-4411 / 800-424-9300CHEMTREC

Year Procured: 1992

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URL for this msds <http://siri.org>. If you wish to change, add to, or  
delete information in this archive please send updates to [dan@siri.org](mailto:dan@siri.org).

B P OIL -- GASOLINE,BP PLUS - GASOLINE, AUTOMOTIVE  
MATERIAL SAFETY DATA SHEET  
NSN: 9130001487104  
Manufacturer's CAGE: 0MJ97  
Part No. Indicator: A  
Part Number/Trade Name: GASOLINE,BP PLUS

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General Information

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Item Name: GASOLINE, AUTOMOTIVE  
Company's Name: B P OIL COMPANY  
Company's Street: 200 PUBLIC SQUARE  
Company's P. O. Box: 6989  
Company's City: CLEVELAND  
Company's State: OH  
Company's Country: US  
Company's Zip Code: 44114-2375  
Company's Emerg Ph #: 800-321-8642/800-362-8059(OH ONLY)  
Company's Info Ph #: 216-586-6499/800-424-9300(CHEMTREC)  
Record No. For Safety Entry: 025  
Tot Safety Entries This Stk#: 102  
Status: SE  
Date MSDS Prepared: 28APR89  
Safety Data Review Date: 17OCT92  
Supply Item Manager: KY  
MSDS Preparer's Name: PATNESKY  
MSDS Serial Number: BPBJD  
Specification Number: VVG001690A  
Spec Type, Grade, Class: PREMIUM GRADE  
Hazard Characteristic Code: F2  
Unit Of Issue: GL  
Unit Of Issue Container Qty: BULK

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Ingredients/Identity Information

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Proprietary: NO  
Ingredient: BENZENE (SARA III)  
Ingredient Sequence Number: 01  
Percent: 2  
NIOSH (RTECS) Number: CY1400000  
CAS Number: 71-43-2  
OSHA PEL: 1PPM/5STEL;1910.1028  
ACGIH TLV: 10 PPM; A2; 9293  
Other Recommended Limit: NONE RECOMMENDED

Proprietary: NO  
Ingredient: TOLUENE (SARA III)  
Ingredient Sequence Number: 02  
Percent: 7  
NIOSH (RTECS) Number: XS5250000  
CAS Number: 108-88-3  
OSHA PEL: 200 PPM/150 STEL  
ACGIH TLV: 50 PPM; 9293  
Other Recommended Limit: NONE RECOMMENDED

Proprietary: NO  
Ingredient: XYLENES (O-,M-,P- ISOMERS) (SARA III)  
Ingredient Sequence Number: 03  
Percent: 8  
NIOSH (RTECS) Number: ZE2100000  
CAS Number: 1330-20-7  
OSHA PEL: 100 PPM/150 STEL  
ACGIH TLV: 100 PPM/150STEL;9293  
Other Recommended Limit: NONE RECOMMENDED

Proprietary: NO

Ingredient: 1,2,4-TRIMETHYLBENZENE (SARA III)  
Ingredient Sequence Number: 04  
Percent: 2  
NIOSH (RTECS) Number: DC3325000  
CAS Number: 95-63-6  
OSHA PEL: 25 PPM  
ACGIH TLV: 25 PPM; 9293  
Other Recommended Limit: NONE RECOMMENDED

Proprietary: NO  
Ingredient: ETHYL BENZENE (SARA III)  
Ingredient Sequence Number: 05  
Percent: 2  
NIOSH (RTECS) Number: DA0700000  
CAS Number: 100-41-4  
OSHA PEL: 100 PPM/125 STEL  
ACGIH TLV: 100 PPM/125 STEL 9293  
Other Recommended Limit: NONE RECOMMENDED

Proprietary: NO  
Ingredient: CYCLOHEXANE (SARA III)  
Ingredient Sequence Number: 06  
Percent: 1  
NIOSH (RTECS) Number: GU6300000  
CAS Number: 110-82-7  
OSHA PEL: 300 PPM  
ACGIH TLV: 300 PPM; 9293  
Other Recommended Limit: NONE RECOMMENDED

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#### Physical/Chemical Characteristics

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Appearance And Odor: CLEAR LIQUID WITH A STRONG HYDROCARBON ODOR.  
Boiling Point: 55.0F, 12.8C  
Vapor Pressure (MM Hg/70 F): 760  
Vapor Density (Air=1): 1.2  
Specific Gravity: 0.73  
Decomposition Temperature: UNKNOWN  
Evaporation Rate And Ref: >1 (WATER = 1)  
Solubility In Water: NEGLIGIBLE  
Percent Volatiles By Volume: 100  
Viscosity: UNKNOWN  
Corrosion Rate (IPY): UNKNOWN  
Autoignition Temperature: 833F

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#### Fire and Explosion Hazard Data

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Flash Point: -35F, -37C  
Flash Point Method: TCC  
Lower Explosive Limit: 1.4  
Upper Explosive Limit: 7.6  
Extinguishing Media: USE WATER FOG, CARBON DIOXIDE, FOAM, OR DRY CHEMICAL.  
WATER STREAM MAY BE INEFFECTIVE.  
Special Fire Fighting Proc: WEAR FIRE FIGHTING PROTECTIVE EQUIPMENT AND A  
FULL FACED SELF CONTAINED BREATHING APPARATUS. COOL FIRE EXPOSED CONTAINERS  
WITH WATER SPRAY.  
Unusual Fire And Expl Hazrds: VAPORS FORM EXPLOSIVES MIXTURES WITH AIR.  
VAPORS MAY TRAVEL A LONG DISTANCE TO IGNITION SOURCE AND FLASHBACK. FIRE  
MAY FORM HAZARDOUS DECOMPOSITION PRODUCTS.

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#### Reactivity Data

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Stability: YES  
Cond To Avoid (Stability): HIGH HEAT, OPEN FLAMES AND OTHER SOURCES OF  
IGNITION  
Materials To Avoid: STRONG OXIDIZING AGENTS  
Hazardous Decomp Products: CARBON OXIDES, AND VARIOUS HYDROCARBONS WHEN

BURNED.  
Hazardous Poly Occur: NO  
Conditions To Avoid (Poly): NOT APPLICABLE

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Health Hazard Data

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LD50-LC50 Mixture: LD50 ORAL RAT IS UNKNOWN  
Route Of Entry - Inhalation: YES  
Route Of Entry - Skin: NO  
Route Of Entry - Ingestion: NO  
Health Haz Acute And Chronic: ACUTE: IRRITATION BY CONTACT. CENTRAL NERVOUS SYSTEM EFFECTS IF INHALED. IF SWALLOWED, MAY BE ASPIRATED INTO REPEATED CONTACT MAY CAUSE DEFATTING. BENZENE IS A CONFIRMED CARCINOGEN AND MAY PRODUCE BLOOD CHANGES.  
Carcinogenicity - NTP: YES  
Carcinogenicity - IARC: YES  
Carcinogenicity - OSHA: YES  
Explanation Carcinogenicity: BENZENE IS A CONFIRMED CARCINOGEN BY NTP, IARC AND OSHA.  
Signs/Symptoms Of Overexp: EYES/SKIN: SLIGHT IRRITATION, REDNESS.  
INGESTION: NAUSEA, VOMITING, DIARRHEA, HEADACHE, DIZZINESS, BLURRED VISION, CONVULSION, UNCONSCIOUSNESS, DEATH. ASPIRATION INTO LUNG AFTER INGESTION MAY CAUSE PULMONARY EDEMA AND CHEMICAL PNEUMONITIS. INHALATION: SAME SYMPTOMS AS INGESTION PLUS ANEMIA AND IRREGULAR HEART RHYTHM.  
Med Cond Aggravated By Exp: INDIVIDUALS WITH A HISTORY OF RESPIRATORY DISORDERS MAY BE AT INCREASED RISK FROM EXPOSURE.  
Emergency/First Aid Proc: EYES: FLUSH WITH PLENTY OF WATER FOR 15 MINUTES.SEE DOCTOR. SKIN: REMOVE CONTAMINATED CLOTHING AND SHOES. WASH WITH SOAP AND WATER.SEE DOCTOR. INHALATION: REMOVE VICTIM TO FRESH AIR.GIVE OXYGEN/CPR IF NEEDED.SEE DOCTOR. INGESTION: DO NOT INDUCE VOMITING.SEE DOCTOR IMMEDIATELY. \*\*\* NOTE TO PHYSICIAN: GASTRIC LAVAGE USING CUFFED ENDOTRACHEAL TUBE MAY BE PERFORMED AT YOUR DISCRETION \*\*\*

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Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: LIMINATE IGNITION SOURCES. REMOVE PERSONNEL. STAY UPWIND. USE WATER SPRAY TO REDUCE VAPORS. WEAR PROPER PROTECTIVE EQUIPMENT. STOP LEAK. DIKE FAR AHEAD OF SPILL FOR LATER DISPOSAL. FOR SMALL SPILL, TAKE UP IN INERT MATERIAL, THEN FLUSH WITH WATER.  
Neutralizing Agent: NOT APPLICABLE.  
Waste Disposal Method: CONSULT YOUR LOCAL ENVIRONMENTAL OFFICER.  
MANUFACTURER RECOMMENDS INCINERATION OR TRANSFER TO RCRA PERMITTED WASTE MANAGEMENT FACILITY. DISPOSE OF IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.  
Precautions-Handling/Storing: STORE IN COOL, DRY, WELL VENTILATED PLACE, AWAY FROM HEAT, IGNITION SOURCES AND INCOMPATIBLE MATERIALS. KEEP CONTAINERS CLOSED WHEN NOT IN USE.  
Other Precautions: AVOID BREATHING VAPORS, AND EYE AND SKIN CONTACT. USE ONLY WITH ADEQUATE VENTILATION. DO NOT SIPHON BY MOUTH. BOND AND GROUND CONTAINERS DURING TRANSFER. EMPTY CONTAINERS MAY CONTAIN TOXIC OR EXPLOSIVE RESIDUE OR VAPORS.

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Control Measures

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Respiratory Protection: NIOSH/MSHA RESPIRATOR WITH ORGANIC VAPOR CARTRIDGE APPROPRIATE FOR EXPOSURE OF CONCERN OR SCBA IF TLV IS EXCEEDED.  
Ventilation: SUFFICIENT MECHANICAL (GENERAL) AND/OR LOCAL EXHAUST VENTILATION. USE EXPLOSION-PROOF EQUIPMENT.  
Protective Gloves: VITON, NITRILE, PVA.  
Eye Protection: SAFETY GLASSES WITH SIDE SHIELDS.  
Other Protective Equipment: FULL BODY LONG-SLEEVED GARMENTS TO PREVENT REPEATED OR PROLONGED SKIN CONTACT. EYE WASH STATION AND SAFETY SHOWER.  
Work Hygienic Practices: AVOID CONTACT WITH EYES AND SKIN. DO NOT BREATHE VAPORS. WASH THOROUGHLY AFTER HANDLING. LAUNDER CONTAMINATED CLOTHING.  
Suppl. Safety & Health Data: THESE PRECAUTIONS ARE FOR NORMAL USES AND CONDITIONS. WHERE SPECIAL OR UNUSUAL CONDITIONS EXIST, CONSULT AN



INDUSTRIAL HYGIENIST. RCRA CLASSIFICATION IGNITABLE (D001). BP TOXIC (D008).

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Transportation Data

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Trans Data Review Date: 92291  
DOT PSN Code: GTN  
DOT Proper Shipping Name: GASOLINE  
DOT Class: 3  
DOT ID Number: UN1203  
DOT Pack Group: II  
DOT Label: FLAMMABLE LIQUID  
IMO PSN Code: HRV  
IMO Proper Shipping Name: GASOLINE  
IMO Regulations Page Number: 3141  
IMO UN Number: 1203  
IMO UN Class: 3.1  
IMO Subsidiary Risk Label: -  
IATA PSN Code: RMF  
IATA UN ID Number: 1203  
IATA Proper Shipping Name: MOTOR SPIRIT  
IATA UN Class: 3  
IATA Label: FLAMMABLE LIQUID  
AFI PSN Code: MUC  
AFI Prop. Shipping Name: GASOLINE  
AFI Class: 3  
AFI ID Number: UN1203  
AFI Pack Group: II  
AFI Label: FLAMMABLE LIQUID  
AFI Basic Pac Ref: 7-7

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Disposal Data

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Label Data

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Label Required: YES  
Technical Review Date: 17OCT92  
Label Status: F  
Common Name: GASOLINE,BP PLUS  
Signal Word: DANGER!  
Acute Health Hazard-Moderate: X  
Contact Hazard-Slight: X  
Fire Hazard-Severe: X  
Reactivity Hazard-None: X  
Special Hazard Precautions: ACUTE: IRRITATION BY CONTACT. CENTRAL NERVOUS SYSTEM EFFECTS IF INHALED. IF SWALLOWED, MAY BE ASPIRATED INTO LUNGS, RESULTING IN PULMONARY EDEMA AND CHEMICAL PNEUMONITIS. CHRONIC: REPEATED CONTACT MAY CAUSE DEFATTING. BENZENE IS A CONFIRMED CARCINOGEN AND MAY PRODUCE BLOOD CHANGES. FIRST AID: EYES: FLUSH WITH WATER FOR 15 MINUTES.SEE DOCTOR. SKIN: REMOVE CONTAMINATED CLOTHING AND SHOES. WASH WITH SOAP AND WATER.SEE DOCTOR. INHALATION: REMOVE VICTIM TO FRESH AIR.GIVE OXYGEN/CPR IF NEEDED.SEE DOCTOR. INGESTION: DO NOT INDUCE VOMITING.SEE DOCTOR IMMEDIATELY. NOTE TO DOCTOR: GASTRIC LAVAGE USING CUFFED ENDOTRACHEAL TUBE MAY BE PERFORMED.  
Protect Eye: Y  
Protect Skin: Y  
Label Name: B P OIL COMPANY  
Label Street: 200 PUBLIC SQUARE  
Label P.O. Box: 6989  
Label City: CLEVELAND  
Label State: OH  
Label Zip Code: 44114-2375  
Label Country: US  
Label Emergency Number: 800-321-8642/800-362-8059(OH ONLY)

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QUIKRETE - GENERAL PURPOSE GROUT, 1585-01  
MATERIAL SAFETY DATA SHEET  
NSN: 561000N070182  
Manufacturer's CAGE: 7K226  
Part No. Indicator: A  
Part Number/Trade Name: GENERAL PURPOSE GROUT, 1585-01

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General Information

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Company's Name: QUIKRETE CO  
Company's Street: 1790 CENTURY CIRCLE  
Company's City: ATLANTA  
Company's State: GA  
Company's Country: US  
Company's Zip Code: 30345  
Company's Emerg Ph #: 404-634-9100  
Company's Info Ph #: 404-634-9100  
Record No. For Safety Entry: 001  
Tot Safety Entries This Stk#: 001  
Status: SMJ  
Date MSDS Prepared: 14JUL93  
Safety Data Review Date: 24APR96  
MSDS Serial Number: BZSQN

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Ingredients/Identity Information

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Proprietary: NO  
Ingredient: SILICA, CRYSTALLINE - QUARTZ; (SILICA SAND, CRYSTALLINE)  
Ingredient Sequence Number: 01  
NIOSH (RTECS) Number: VV7330000  
CAS Number: 14808-60-7  
OSHA PEL: 0.1 MG/M3 (MFR)  
ACGIH TLV: 0.1 MG/M3 RDUST

Proprietary: NO  
Ingredient: SILICATE, PORTLAND CEMENT; (PORTLAND CEMENT)  
Ingredient Sequence Number: 02  
NIOSH (RTECS) Number: VV8770000  
CAS Number: 65997-15-1  
OSHA PEL: 50 MPPCF  
ACGIH TLV: 10 MG/M3 TDUST

Proprietary: NO  
Ingredient: CALCIUM (II) SULFATE, DIHYDRATE (1:1:2); (GYPSUM)  
Ingredient Sequence Number: 03  
NIOSH (RTECS) Number: EW4150000  
CAS Number: 10101-41-4  
OSHA PEL: 15 MG/M3 TDUST  
ACGIH TLV: 10 MG/M3 TDUST

Proprietary: NO  
Ingredient: CALCIUM HYDROXIDE; (LIME)  
Ingredient Sequence Number: 04  
NIOSH (RTECS) Number: EW2800000  
CAS Number: 1305-62-0  
OSHA PEL: 15 MG/M3 TDUST  
ACGIH TLV: 5 MG/M3

Proprietary: NO  
Ingredient: MAY CONTAIN ONE OR MORE OF INGREDIENTS 6 - 10.  
Ingredient Sequence Number: 05  
NIOSH (RTECS) Number: 9999999Z  
OSHA PEL: N/K (FP N)  
ACGIH TLV: N/K (FP N)

Proprietary: NO

Ingredient: SILICA GEL; (AMORPHOUS SILICA (FROM FLY ASH OR MICRO SILICA))

Ingredient Sequence Number: 06

NIOSH (RTECS) Number: VV7310000

CAS Number: 7631-86-9

OSHA PEL: 6 MG/M3

ACGIH TLV: 10 MG/M3

Proprietary: NO

Ingredient: ALUMINUM OXIDE (2:3); (ALUMINA (FROM FLY ASH OR CALCIUM ALUMINATE CEMENT)) (SARA 313)

Ingredient Sequence Number: 07

NIOSH (RTECS) Number: BD1200000

CAS Number: 1344-28-1

OSHA PEL: 15 MG/M3 TDUST

ACGIH TLV: 10 MG/M3 TDUST

Proprietary: NO

Ingredient: CLAY (KAOLIN); (CLAY)

Ingredient Sequence Number: 08

NIOSH (RTECS) Number: GF1670500

CAS Number: 1332-58-7

OSHA PEL: 15 MG/M3 TDUST

ACGIH TLV: 2 MG/M3 TDUST

Proprietary: NO

Ingredient: CALCIUM CARBONATE; (PULVERIZED LIMESTONE)

Ingredient Sequence Number: 09

NIOSH (RTECS) Number: EV9580000

CAS Number: 1317-65-3

OSHA PEL: 15 MG/M3 TDUST

ACGIH TLV: 10 MG/M3 TDUST

Proprietary: NO

Ingredient: SILICA, CRYSTALLINE - QUARTZ; (GLASS FIBERS)

Ingredient Sequence Number: 10

NIOSH (RTECS) Number: VV7330000

CAS Number: 14808-60-7

OSHA PEL: 0.1 MG/M3 (MFR)

ACGIH TLV: 0.1 MG/M3 RDUST

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#### Physical/Chemical Characteristics

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Appearance And Odor: GRAY TO BROWN COLORED POWDER W/NO ODOR.

Boiling Point: N/A

Melting Point: N/A

Vapor Pressure (MM Hg/70 F): N/A

Vapor Density (Air=1): N/A

Specific Gravity: N/A

Evaporation Rate And Ref: NOT APPLICABLE

Solubility In Water: SLIGHT

---

#### Fire and Explosion Hazard Data

---

Extinguishing Media: MEDIA SUITABLE FOR SURROUNDING FIRE (FP N).

Special Fire Fighting Proc: USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).

Unusual Fire And Expl Hazrds: NONCOMBUSTIBLE & NOT EXPLOSIVE.

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#### Reactivity Data

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Stability: YES

Cond To Avoid (Stability): KEEP DRY UNTIL USED TO PRESERVE PRODUCT UTILITY.

Materials To Avoid: CONT OF SILICA W/POWERFUL OXIDIZING AGENTS SUCH AS FLUORINE, CHLORINE TRIFLUORIDE, MANGANESE TRIOXIDE, OXYGEN (SUPDAT)

Hazardous Decomp Products: SILICA WILL DISSOLVE IN HYDROFLUORIC ACID &

PRODUCE A CORROSIVE GAS - SILICON TETRAFLUORIDE.  
Hazardous Poly Occur: NO  
Conditions To Avoid (Poly): NOT RELEVANT

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Health Hazard Data

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LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.  
Route Of Entry - Inhalation: YES  
Route Of Entry - Skin: YES  
Route Of Entry - Ingestion: YES  
Health Haz Acute And Chronic: ACUTE:PROD BECOMES ALKALINE WHEN EXPOS TO MOISTURE. EXPOS CAN DRY SKIN, CAUSE ALKALI BURNS & EFT MUC MEMBS. DUST CAN IRRIT EYES & UPPER RESP SYS. TOX EFTS NOTED IN ANIMALS INCL, FOR ACUTE EXPOS, ALVEOLAR DMG W/PULM EDEMA. SYMPS OF EXCESSIVE EXPOS TO DUST INCL SHORTNESS OF BREATH & REDUCED PULM FUNC. (EFTS OF OVEREXP)  
Carcinogenicity - NTP: YES  
Carcinogenicity - IARC: YES  
Carcinogenicity - OSHA: NO  
Explanation Carcinogenicity: SILICA, CRYSTALLINE-QUARTZ:IARC MONOGRAPHS, SUPP, VOL 7, PG 341, 1987:GRP 2A. NTP 7TH ANNUAL RPT ON CARCINS, (SUPP DATA)  
Signs/Symptoms Of Overexp: HLTH HAZ:EXCESSIVE EXPOS TO SKIN & EYES ESP DUST CAN CAUSE INFLAMM OF LINING TISS OF INTERIOR OF NOSE & INFLAMM OF CORNEA. HYPERSENSITIVE INDIVIDUALS MAY DEVELOP ALLERGIC DERM. EXCESSIVE INHAL OF SILICA DUST MAY RSLT IN RESP DISEASE, (SUPP DATA)  
Med Cond Aggravated By Exp: INDIVIDUALS W/SENSITIVE SKIN & W/PULMONARY &/OR RESPIRATORY DISEASE, INCLUDING, BUT NOT LIMITED TO, ASTHMA & BRONCHITIS, OR SUBJECT TO EYE IRRITATION, SHOULD BE PRECLUDED FROM EXPOSURE.  
IRRIGATE (FLOOD) IMMEDIATELY & REPEATEDLY W/CLEAN WATER. SKIN:WASH EXPOSED AREAS W/SOAP & WATER. IF IRRITATION OR INFLAMMATION OCCURS SEEK PROMPT MEDICAL ATTENTION. INHAL:REMOVE PERSON IMMEDIATELY TO FRESH AIR, GIVE ARTIFICIAL RESPIRATION AS NEEDED. GET PROMPT MEDICAL ATTENTION.

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Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: IF SPILLED, USE DUSTLESS METHODS (VACUUM) & PLACE INTO CLOSABLE CONTAINER FOR DISPOSAL OR USE IF NOT CONTAMINATED OR WET. USE ADEQUATE VENTILATION.  
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.  
Waste Disposal Method: CAN BE TREATED AS A COMMON WASTE FOR DISPOSAL I/A/ W FEDERAL, STATE & LOCAL REGULATIONS.  
Precautions-Handling/Storing: PRECAUTIONS MUST BE OBSERVED BECAUSE BURNS OCCUR W/LITTLE WARNING - LITTLE HEAT IS SENSED.  
Other Precautions: CUSTOMERS-USERS MUST COMPLY W/ALL APPLICABLE HEALTH & SAFETY LAWS, REGULATIONS & ORDERS COVERING SILICA.

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Control Measures

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Respiratory Protection: IN DUSTY ENVIRONMENTS, THE USE OF A NIOSH/MSHA APPROVED RESPIRATOR IS RECOMMENDED.  
Ventilation: LOCAL EXHAUST CAN BE USED, IF NECESSARY, TO CONTROL AIRBORNE DUST LEVELS.  
Protective Gloves: IMPERVIOUS GLOVES.  
Eye Protection: ANSI APPROVED CHEM WORKERS GOGGS (FP N).  
Other Protective Equipment: EYE WASH FOUNTAIN & DELUGE SHOWER WHICH MEET ANSI DESIGN CRITERIA (FP N). USE OF BARRIER CREAMS, BOOTS & CLTHG (SUPDAT)  
Work Hygienic Practices: FOLLOWING WORK, WORKERS SHOULD SHOWER W/SOAP & WATER.  
Suppl. Safety & Health Data: MATLS TO AVOID:DIFLUORIDE, MAY CAUSE FIRES.  
EXPLAN OF CARCIN:1994:ANTIC TO BE CARCIN. EFTS OF OVEREXP:INCL SILICOSIS, PNEUMOCONIOSIS. PULM FIBROSIS & POSSIBLY CANCER. OTHER PROT EQUIP:TO PROTECT SKIN FROM CONTACT IF RECOMMENDED.

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Transportation Data

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Disposal Data

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Label Data

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Label Required: YES  
Technical Review Date: 24APR96  
Label Date: 18MAR96  
Label Status: B  
Common Name: GENERAL PURPOSE GROUT, 1585-01  
Chronic Hazard: YES  
Signal Word: WARNING!  
Acute Health Hazard-Slight: X  
Contact Hazard-Moderate: X  
Fire Hazard-None: X  
Reactivity Hazard-None: X  
Special Hazard Precautions: ACUTE: PRODUCT BECOMES ALKALINE WHEN EXPOSED TO MOISTURE. EXPOSURE CAN DRY SKIN, CAUSE ALKALI BURNS & EFFECT MUCOUS MEMBRANES. DUST CAN IRRITATE EYES & UPPER RESPIRATORY SYSTEM. TOXIC EFFECTS NOTED IN ANIMALS INCLUDE, FOR ACUTE EXPOSURE, ALVEOLAR DAMAGE WITH PULMONARY EDEMA. SYMPTOMS OF EXCESSIVE EXPOSURE TO DUST INCLUDE SHORTNESS OF BREATH & REDUCED PULMONARY FUNCTION. EXCESSIVE EXPOSURE TO SKIN & EYES WHEN MIXED WITH WATER MAY CAUSE CAUSTIC BURNS AS SEVERE AS THIRD DEGREE. CHRONIC: CANCER HAZARD. CONTAINS SILICA, CRYSTALLINE-QUARTZ, WHICH IS LISTED AS AN ANIMAL LUNG CARCINOGEN (FP N).  
Protect Eye: X  
Protect Skin: X  
Protect Respiratory: X  
Label Name: QUIKRETE CO  
Label Street: 1790 CENTURY CIRCLE  
Label City: ATLANTA  
Label State: GA  
Label Zip Code: 30345  
Label Country: US  
Label Emergency Number: 404-634-9100

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URL for this msds <http://siri.org>. If you wish to change, add to, or delete information in this archive please send updates to [dan@siri.org](mailto:dan@siri.org).

CHEM SERVICE -- N-HEXANE, 0-735  
MATERIAL SAFETY DATA SHEET  
NSN: 681000N054687  
Manufacturer's CAGE: 8Y898  
Part No. Indicator: A  
Part Number/Trade Name: N-HEXANE, 0-735

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General Information

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Company's Name: CHEM SERVICE INC  
Company's P. O. Box: 3108  
Company's City: WEST CHESTER  
Company's State: PA  
Company's Country: US  
Company's Zip Code: 19381  
Company's Emerg Ph #: 215-692-3026  
Company's Info Ph #: 215-692-3026  
Record No. For Safety Entry: 001  
Tot Safety Entries This Stk#: 001  
Status: SMJ  
Date MSDS Prepared: 27AUG93  
Safety Data Review Date: 27OCT94  
MSDS Serial Number: BVXWX  
Hazard Characteristic Code: NK

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Ingredients/Identity Information

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Proprietary: NO  
Ingredient: HEXANE; (N-HEXANE)  
Ingredient Sequence Number: 01  
NIOSH (RTECS) Number: MN9275000  
CAS Number: 110-54-3  
OSHA PEL: 500 PPM  
ACGIH TLV: 50 PPM

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Physical/Chemical Characteristics

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Appearance And Odor: COLORLESS LIQUID.  
Boiling Point: 156F, 69C  
Melting Point: -139F, -95C  
Vapor Pressure (MM Hg/70 F): 124 @ 20C  
Specific Gravity: 0.659  
Solubility In Water: INSOLUBLE

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Fire and Explosion Hazard Data

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Flash Point: -9F, -23C  
Lower Explosive Limit: 1.1%  
Upper Explosive Limit: 7.5%  
Extinguishing Media: CARBON DIOXIDE, DRY CHEMICAL POWDER OR SPRAY.  
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED SCBA AND FULL  
PROTECTIVE EQUIPMENT (FP N).  
Unusual Fire And Expl Hazrds: NONE SPECIFIED BY MANUFACTURER.

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Reactivity Data

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Stability: YES  
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.  
Materials To Avoid: STRONG OXIDIZING AGENTS.  
Hazardous Decomp Products: DECOMPOSITION LIBERATES TOXIC FUMES.  
DECOMPOSITION PRODUCTS ARE CORROSIVE. FLAMMABLE.  
Hazardous Poly Occur: NO  
Conditions To Avoid (Poly): NOT RELEVANT.

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Health Hazard Data

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LD50-LC50 Mixture: LD50 (ORAL,RAT): 28,750 MG/KG.

Route Of Entry - Inhalation: YES

Route Of Entry - Skin: YES

Route Of Entry - Ingestion: YES

Health Haz Acute And Chronic: CONTACT LENSES SHOULD NOT BE WORN IN

LABORATORY. ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS-AVOID DIRECT PHYSICAL CONTACT! MAY BE HARMFUL IF ABSORBED THROUGH SKIN. MAY BE HARMFUL IF INHALED. CAN CAUSE SKIN IRRITATION. CAN BE IRRITATING TO MUCOUS MEMBRANES. CAN CAUSE BLOOD DISORDERS. CAN CAUSE NERVOUS(EFTS OF OVEREXP)

Carcinogenicity - NTP: NO

Carcinogenicity - IARC: NO

Carcinogenicity - OSHA: NO

Explanation Carcinogenicity: NOT RELEVANT.

Signs/Symptoms Of Overexp: HEALTH HAZARDS: SYSTEM INJURY. CAN CAUSE ADVERSE REPRODUCTIVE EFFECTS. CAN CAUSE EYE IRRITATION. MAY BE HARMFUL IF SWALLOWED. CAN CAUSE DELAYED LUNG INJURY. CAN CAUSE GASTRO-INTESTINAL DISTURBANCES. MAY BE FATAL IF SWALLOWED!

Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.

Emergency/First Aid Proc: AN ANTIDOTE IS SUBSTANCE INTENDED TO COUNTERACT EFFECT OF POISON. IT SHOULD BE ADMIN ONLY BY PHYS OR TRAINED EMER PERS. MED ADVICE CAN BE OBTAINED FROM POISON CONTROL CENTER. INHALATION: REMOVE FROM EXPOSURE. SUPPORT BREATHING (GIVE ARTIFICIAL RESPIRATION/OXYGEN) (FP N). SKIN: FLUSH W/COPIOUS AMTS OF WATER (FP N). EYE: FLUSH W/WATER FOR AT LST 15 MINS (FP N). INGEST: CALL MD IMMED (FP N).

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#### Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROPRIATE OSHA REGULATED EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE OR SIMILAR MATERIAL. SWEEP UP AND PLACE IN AN APPROPRIATE CONTAINER. HOLD FOR DISPOSAL. WASH CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.

Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.

Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER. DISPOSE OF IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS (FP N).

Precautions-Handling/Storing: AVOID CONTACT WITH SKIN, EYES AND CLOTHING. KEEP TIGHTLY CLOSED IN COOL DRY PLACE. STORE ONLY WITH COMPATIBLE CHEMICALS.

Other Precautions: NONE SPECIFIED BY MANUFACTURER.

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#### Control Measures

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Respiratory Protection: WEAR NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N).

Ventilation: CHEMICAL SHOULD BE HANDLED ONLY IN HOOD.

Protective Gloves: IMPERVIOUS GLOVES (FP N).

Eye Protection: ANSI APPROVED CHEM WORKERS GOGG (FP N).

Other Protective Equipment: USE APPROPRIATE OSHA/MSHA APPROVED SAFETY EQUIPMENT.

Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.

Suppl. Safety & Health Data: NONE SPECIFIED BY MANUFACTURER.

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#### Transportation Data

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#### Disposal Data

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#### Label Data

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Label Required: YES

Technical Review Date: 27OCT94

Label Date: 26OCT94

Label Status: G

Common Name: N-HEXANE, 0-735

Chronic Hazard: NO



Signal Word: DANGER!

Acute Health Hazard-Slight: X

Contact Hazard-Slight: X

Fire Hazard-Severe: X

Reactivity Hazard-None: X

Special Hazard Precautions: FLAMMABLE. CONTACT LENSES SHOULD NOT BE WORN IN LABORATORY. ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS-AVOID DIRECT PHYSICAL CONTACT! ACUTE: MAY BE HARMFUL IF ABSORBED THROUGH SKIN. MAY BE HARMFUL IF INHALED. CAN CAUSE SKIN IRRITATION. CAN BE IRRITATING TO MUCOUS MEMBRANES. CAN CAUSE BLOOD DISORDERS. CAN CAUSE NERVOUS SYSTEM INJURY. CAN CAUSE ADVERSE REPRODUCTIVE EFFECTS. CAN CAUSE EYE IRRITATION. MAY BE HARMFUL IF SWALLOWED. CAN CAUSE DELAYED LUNG INJURY. CAN CAUSE GASTROINTESTINAL DISTURBANCES. MAY BE FATAL IF SWALLOWED. CHRONIC: NONE LISTED BY MANUFACTURER.

Protect Eye: Y

Protect Skin: Y

Protect Respiratory: Y

Label Name: CHEM SERVICE INC

Label P.O. Box: 3108

Label City: WEST CHESTER

Label State: PA

Label Zip Code: 19381

Label Country: US

Label Emergency Number: 215-692-3026

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ENCON SAFETY PRODUCTS - HYDROSEP  
MATERIAL SAFETY DATA SHEET  
NSN: 685000F034698  
Manufacturer's CAGE: 51542  
Part No. Indicator: A  
Part Number/Trade Name: HYDROSEP

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General Information

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Company's Name: ENCON SAFETY PRODUCTS  
Company's Street: 6825 W SAM HOUSTON PKY N  
Company's City: HOUSTON  
Company's State: TX  
Company's Country: US  
Company's Zip Code: 77041  
Company's Emerg Ph #: 713-466-1449  
Company's Info Ph #: 713-466-1449  
Record No. For Safety Entry: 001  
Tot Safety Entries This Stk#: 001  
Status: SE  
Date MSDS Prepared: 01OCT94  
Safety Data Review Date: 19MAY95  
MSDS Preparer's Name: GABE MAZIE  
Preparer's Company: ENCON SAFETY PRODUCTS  
Preparer's St Or P. O. Box: 6825 W SAM HOUSTON PKY N  
Preparer's City: HOUSTON  
Preparer's State: TX  
Preparer's Zip Code: 77041  
MSDS Serial Number: BTHZM  
Specification Number: UNKNOWN  
Spec Type, Grade, Class: UNKNOWN  
Hazard Characteristic Code: N1  
Unit Of Issue Container Qty: UNKNOWN  
Type Of Container: UNKNOWN  
Net Unit Weight: UNKNOWN

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Ingredients/Identity Information

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Proprietary: NO  
Ingredient: CHLORHEXIDINE GLUCONATE  
Ingredient Sequence Number: 01  
NIOSH (RTECS) Number: DU1950000  
CAS Number: 18472-51-0

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Physical/Chemical Characteristics

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Appearance And Odor: WATER LIKE.  
Boiling Point: AS WATER  
Melting Point: AS WATER  
Vapor Pressure (MM Hg/70 F): AS WATER  
Vapor Density (Air=1): AS WATER  
Specific Gravity: <1.01  
Solubility In Water: COMPLETE

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Fire and Explosion Hazard Data

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Flash Point: NONE  
Unusual Fire And Expl Hazrds: NONE

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Reactivity Data

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Stability: YES  
Cond To Avoid (Stability): STORAGE >98.6F.  
Materials To Avoid: NONE.  
Hazardous Poly Occur: NO

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Health Hazard Data

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LD50-LC50 Mixture: ORAL LD50 (RAT) IS UNKNOWN  
Route Of Entry - Inhalation: NO  
Route Of Entry - Skin: NO  
Route Of Entry - Ingestion: NO  
Health Haz Acute And Chronic: SKIN/EYE: IRRITATION WHEN EXPOSED TO  
CONCENTRATED DOSAGES ONLY.  
Carcinogenicity - NTP: NO  
Carcinogenicity - IARC: NO  
Carcinogenicity - OSHA: NO  
Explanation Carcinogenicity: NONE  
Signs/Symptoms Of Overexp: SKIN/EYES: IRRITATION WHEN EXPOSED TO  
CONCENTRATED DOSAGES ONLY.  
Med Cond Aggravated By Exp: DERMATITIS.  
Emergency/First Aid Proc: FLUSH W/1-2 LITERS OF WATER. OBTAIN MEDICAL  
ATTENTION IN ALL CASES.

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Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: FLUSH W/WATER.  
Waste Disposal Method: FLUSH W/WATER IAW/FEDERAL, STATE & LOCAL  
REGULATIONS.  
Precautions-Handling/Storing: DON'T SPILL ON SKIN/INTO EYES/EARS. FLUSH W/  
1-2 LITERS OF WATER.  
Other Precautions: NONE

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Control Measures

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Respiratory Protection: NONE REQUIRED  
Ventilation: LOCAL EXHAUST.  
Protective Gloves: REQUIRED  
Eye Protection: CHEMICAL GOGGLES  
Other Protective Equipment: NONE REQUIRED  
Work Hygienic Practices: NORMAL CARE IN HANDLING.

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Transportation Data

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Trans Data Review Date: 94144  
DOT PSN Code: ZZZ  
DOT Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION  
IMO PSN Code: ZZZ  
IMO Proper Shipping Name: NOT REGULATED FOR THIS MODE OF TRANSPORTATION  
IATA PSN Code: ZZZ  
IATA Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION  
AFI PSN Code: ZZZ  
AFI Prop. Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION  
Additional Trans Data: NOT REGULATED FOR TRANSPORTATION

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Disposal Data

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Label Data

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Label Required: YES  
Technical Review Date: 24MAY94  
Label Date: 01OCT91  
Label Status: G  
Common Name: HYDROSEP  
Chronic Hazard: NO  
Signal Word: CAUTION!  
Acute Health Hazard-None: X  
Contact Hazard-Slight: X  
Fire Hazard-None: X  
Reactivity Hazard-None: X  
Special Hazard Precautions: ACUTE: EYE AND SKIN IRRITANT. DO NOT SPILL ON

SKIN OR INTO EYES/EARS. TARGET ORGANS: EYES.

Protect Eye: Y

Protect Skin: Y

Label Name: ENCON SAFETY PRODUCTS

Label Street: 13333 NORTHWEST FREEWAY

Label City: HOUSTON

Label State: TX

Label Zip Code: 77040

Label Country: US

Label Emergency Number: 713-462-4723

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SCOTT SPECIALTY GASES -- ISOBUTYLENE IN AIR - CALIBRATION GAS CYL  
MATERIAL SAFETY DATA SHEET

NSN: 6665012148247

Manufacturer's CAGE: 51847

Part No. Indicator: A

Part Number/Trade Name: ISOBUTYLENE IN AIR

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General Information

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Item Name: CALIBRATION GAS CYL

Company's Name: SCOTT SPECIALTY GASES

Company's Street: ROUTE 611 NORTH

Company's City: PLUMSTEADVILLE

Company's State: PA

Company's Country: US

Company's Zip Code: 18949

Company's Emerg Ph #: 215-766-8861; 908-754-7700

Company's Info Ph #: 215-766-8861

Record No. For Safety Entry: 001

Tot Safety Entries This Stk#: 002

Status: SMJ

Date MSDS Prepared: 23APR92

Safety Data Review Date: 27SEP94

MSDS Serial Number: BVRGC

Hazard Characteristic Code: G3

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Ingredients/Identity Information

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Proprietary: NO

Ingredient: PROPENE, 2-METHYL-, (ISOBUTYLENE)

Ingredient Sequence Number: 01

NIOSH (RTECS) Number: UD0890000

CAS Number: 115-11-7

OSHA PEL: N/K (FP N)

ACGIH TLV: N/K (FP N)

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Proprietary: NO

Ingredient: AIR, REFRIGERATED LIQUID; AIR COMPRESSED (UN1002, DOT); AIR  
REFRIGERATED LIQUID (CRYOGENIC LIQUID) (UN1003) (DOT)

Ingredient Sequence Number: 02

NIOSH (RTECS) Number: AX5271000

OSHA PEL: N/K (FP N)

ACGIH TLV: N/K (FP N)

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Physical/Chemical Characteristics

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Appearance And Odor: COLORLESS GAS W/POSSIBLE SLIGHT OLEFINIC ODOR.

Boiling Point: -318F,-194C

Vapor Pressure (MM Hg/70 F): N/A

Vapor Density (Air=1): 1.2

Specific Gravity: 0.88 (H\*20=1)

Evaporation Rate And Ref: NOT APPLICABLE

Solubility In Water: INSOLUBLE

Percent Volatiles By Volume: 100

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Fire and Explosion Hazard Data

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Flash Point: NONFLAMMABLE

Lower Explosive Limit: N/A

Upper Explosive Limit: N/A

Extinguishing Media: USE WHAT IS APPROPRIATE FOR SURROUNDING FIRE.

Special Fire Fighting Proc: USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE  
EQUIPMENT (FP N). USE WATER SPRAY TO KEEP FIRE EXPOSED CYLINDERS COOL.

Unusual Fire And Expl Hazrds: COMPRESSED AIR AT HIGH PRESSURES WILL  
ACCELERATE THE BURNING OF FLAMMABLE MATERIALS.

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Reactivity Data

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Stability: YES  
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.  
Materials To Avoid: NONE.  
Hazardous Decomp Products: NONE.  
Hazardous Poly Occur: NO  
Conditions To Avoid (Poly): NOT RELEVANT

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Health Hazard Data

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LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.  
Route Of Entry - Inhalation: YES  
Route Of Entry - Skin: NO  
Route Of Entry - Ingestion: NO  
Health Haz Acute And Chronic: ACUTE: CONCENTRATION OF ISOBUTYLENE IS THIS MIXTURE SHOULD NOT PRESENT ANY SYMPTOMS OF TOXICITY. CHRONIC: NONE.  
Carcinogenicity - NTP: NO  
Carcinogenicity - IARC: NO  
Carcinogenicity - OSHA: NO  
Explanation Carcinogenicity: NOT RELEVANT  
Signs/Symptoms Of Overexp: NONE SPECIFIED BY MANUFACTURER.  
Med Cond Aggravated By Exp: NONE.  
IMMEDIATELY FLUSH W/POTABLE WATER FOR A MINIMUM OF 15 MINUTES. SEEK ASSISTANCE FROM MD (FP N). SKIN: FLUSH W/COPIOUS AMOUNTS OF WATER. CALL MD (FP N). INHAL: IMMEDIATELY REMOVE VICTIM TO FRESH AIR. IF BREATHING HAS STOPPED, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.

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Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: EVACUATE & VENTILATE AREA. REMOVE LEAKING CYLINDER TO EXHAUST HOOD OR SAFE OUTDOORS AREA IF THIS CAN BE DONE SAFELY.  
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.  
Waste Disposal Method: DISPOSAL MUST BE I/A/W FEDERAL, STATE & LOCAL REGULATIONS (FP N). RETURN CYLS TO SUPPLIER FOR PROPER DISP W/ANY VALVE OUTLET PLUGS/CAPS SECURED & VALVE PROT CAP IN PLACE. ALLOW GAS TO DISCHARGE AT SLOW RATE TO ATM IN UNCONFINED AREA/EXHST HOOD.  
Precautions-Handling/Storing: STORE IN WELL VENTILATED AREAS ONLY. KEEP VALVE PROT CAP ON CYLS WHEN NOT IN USE & SECURE CYL WHEN USING TO PROT FROM FALLING.  
Other Precautions: USE SUITABLE HAND TRUCK TO MOVE CYLS. PROT CYLS FROM PHYSICAL DMG. DO NOT DEFACE CYLS/LBLS. MOVE CYL W/ADEQ HAND TRUCK. CYL SHOULD BE REFILLED BY QUALIFIED PRODUCERS OF COMPRESSED GAS. SHIPMENT OF COMPRESSED GAS CYL WHICH HAS NOT (SUPDAT)

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Control Measures

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Respiratory Protection: USE NIOSH/MSHA APPROVED SCBA IN CASE OF EMERGENCY OR NON-ROUTINE USE.  
Ventilation: PROVIDE ADEQUATE GENERAL & LOCAL EXHAUST VENTILATION.  
Protective Gloves: RUBBER GLOVES.  
Eye Protection: ANSI APPROVED CHEM WORKERS GOGGS (FP N).  
Other Protective Equipment: WEAR SAFETY SHOES. A SAFETY SHOWER & EYEWASH STATION SHOULD BE READILY AVAILABLE.  
Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.  
Suppl. Safety & Health Data: OTHER PREC: BEEN FILLED BY OWNER OR WITH HIS WRITTEN CONSENT IS A VIOLATION OF FEDERAL LAW (49 CFR).

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Transportation Data

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Trans Data Review Date: 94269

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Disposal Data

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Label Data

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Label Required: YES  
Technical Review Date: 27SEP94  
Label Date: 26SEP94  
Label Status: G  
Common Name: ISOBUTYLENE IN AIR  
Chronic Hazard: NO  
Signal Word: NONE  
Acute Health Hazard-None: X  
Contact Hazard-None: X  
Fire Hazard-None: X  
Reactivity Hazard-None: X  
Special Hazard Precautions: ACUTE:CONCENTRATION OF ISOBUTYLENE IS THIS  
MIXTURE SHOULD NOT PRESENT ANY SYMPTOMS OF TOXICITY. CHRONIC:NONE LISTED BY  
MANUFACTURER.  
Protect Eye: Y  
Protect Skin: Y  
Protect Respiratory: Y  
Label Name: SCOTT SPECIALTY GASES  
Label Street: ROUTE 611 NORTH  
Label City: PLUMSTEADVILLE  
Label State: PA  
Label Zip Code: 18949  
Label Country: US  
Label Emergency Number: 215-766-8861; 908-754-7700

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FISHER SCIENTIFIC CHEMICAL DIV - ISOPROPYL ALCOHOL - ISOPROPYL ALCOHOL,ACS  
MATERIAL SAFETY DATA SHEET  
NSN: 6810012751252  
Manufacturer's CAGE: 1B464  
Part No. Indicator: A  
Part Number/Trade Name: ISOPROPYL ALCOHOL

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General Information

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Item Name: ISOPROPYL ALCOHOL,ACS  
Company's Name: FISHER SCIENTIFIC CO CHEMICAL DIV.  
Company's Street: 1 REAGENT LANE  
Company's City: FAIR LAWN  
Company's State: NJ  
Company's Country: US  
Company's Zip Code: 07410  
Company's Emerg Ph #: 201-796-7100 OR 201-796-7523  
Company's Info Ph #: 201-796-7100  
Record No. For Safety Entry: 001  
Tot Safety Entries This Stk#: 002  
Status: SE  
Date MSDS Prepared: 17JAN89  
Safety Data Review Date: 11MAR91  
Supply Item Manager: KX  
MSDS Serial Number: BJPVZ  
Hazard Characteristic Code: F3  
Unit Of Issue: LI  
Unit Of Issue Container Qty: 20 LITERS  
Type Of Container: BOX W/PLASTIC  
Net Unit Weight: 34 LBS

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Ingredients/Identity Information

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Proprietary: NO  
Ingredient: ISOPROPYL ALCOHOL (SARA III)  
Ingredient Sequence Number: 01  
Percent: 100  
NIOSH (RTECS) Number: NT8050000  
CAS Number: 67-63-0  
OSHA PEL: 400 PPM/500 STEL  
ACGIH TLV: 400 PPM/500STEL;9192  
Other Recommended Limit: NONE SPECIFIED

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Physical/Chemical Characteristics

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Appearance And Odor: TRANSPARENT, COLORLESS, MOBILE LIQUID WITH A  
CHARACTERISTIC MILD ALCOHOLIC ODOR.  
Boiling Point: 180F,82C  
Melting Point: -129F,-89C  
Vapor Pressure (MM Hg/70 F): 40 @24C  
Vapor Density (Air=1): 2.1  
Specific Gravity: 0.785  
Decomposition Temperature: UNKNOWN  
Solubility In Water: COMPLETE  
Corrosion Rate (IPY): UNKNOWN

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Fire and Explosion Hazard Data

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Flash Point: 53.0F,11.7C  
Flash Point Method: CC  
Lower Explosive Limit: 2  
Upper Explosive Limit: 12.7  
Extinguishing Media: USE WATER FOG, CARBON DIOXIDE, FOAM, OR DRY CHEMICAL.  
DO NOT USE A DIRECT STREAM OF WATER.  
Special Fire Fighting Proc: FIRE FIGHTERS SHOULD USE NIOSH APPROVED SCBA &  
FULL PROTECTIVE EQUIPMENT WHEN FIGHTING CHEMICAL FIRE. USE WATER SPRAY TO



COOL NEARBY CONTAINERS EXPOSED TO FIRE.  
Unusual Fire And Expl Hazrds: FIRE OR EXCESSIVE HEAT MAY CAUSE PRODUCTION  
OF HAZARDOUS DECOMPOSITION PRODUCTS.

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Reactivity Data

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Stability: YES  
Cond To Avoid (Stability): HIGH TEMPERATURES, SPARKS, AND OPEN FLAMES  
Materials To Avoid: STRONG OXIDIZING AGENTS, ALUMINUM, BARIUM PERCHLORATE,  
OLEUM, PHOSGENE, PLASTICS AND RUBBER (MAY BE DEGRADED).  
Hazardous Decomp Products: INCOMPLETE COMBUSTION MY YIELD CARBON MONOXIDE  
AND OTHER TOXIC GASES  
Hazardous Poly Occur: NO  
Conditions To Avoid (Poly): NOT APPLICABLE

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Health Hazard Data

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LD50-LC50 Mixture: ORAL LD50 (RAT) = 5045 MG/KG  
Route Of Entry - Inhalation: YES  
Route Of Entry - Skin: NO  
Route Of Entry - Ingestion: NO  
Health Haz Acute And Chronic: ACUTE: OVEREXPOSURE MAY LEAD TO CNS  
DEPRESSION, LEADING TO HEADACHES AND DIZZINESS. EYE: MAY LEAD TO IRRITATION  
AND WILL INJURE EYE TISSUE IF NOT REMOVED PROMPTLY. SKIN: NO HEALTH HAZARD  
PROLONGED EXPOSURE CAN BE IRRITATING TO MUCOUS MEMBRANES.

Carcinogenicity - NTP: NO  
Carcinogenicity - IARC: NO  
Carcinogenicity - OSHA: NO  
Explanation Carcinogenicity: THIS CHEMICAL IS NOT LISTED AS HAVING ANY  
EVIDENCE OF BEING CARCINOGENIC.  
Signs/Symptoms Of Overexp: OVEREXPOSURE MAY LEAD TO DIZZINESS, SHORTNESS  
OF BREATH, HEADACHES, VOMITING, DERMATITIS AND EYE IRRITATION (BURNING AND  
TEARING). HIGH VAPOR CONCENTRATIONS ARE ANESTHETIC AND MAY HAVE OTHER  
CENTRAL NERVOUS SYSTEM EFFECTS. CHRONIC SKIN EXPOSURE MAY LEAD TO DEFATTING  
OF TISSUE AND DERMATITIS.  
Med Cond Aggravated By Exp: PERSONS WITH EYE, SKIN, HEART, RESPIRATORY, OR  
ANY OTHER MEDICAL CONDITION SHOULD USE CAUTION WHEN HANDLING OR USING THIS  
PRODUCT.  
Emergency/First Aid Proc: SKIN: REMOVE CONTAMINATED CLOTHING. WASH WITH  
SOAP AND WATER. GET MEDICAL ATTENTION AS REQUIRED. INHALATION: IMMEDIATELY  
REMOVE VICTIM TO FRESH AIR. GIVE OXYGEN OR ARTIFICIAL RESPIRATION AS  
NEEDED. GET PROMPT MEDICAL ATTENTION. EYE: IMMEDIATELY FLUSH WITH WATER FOR  
GET PROMPT MEDICAL ATTENTION. DO NOT INDUCE VOMITING.

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Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: FIRE HAZARD: ELIMINATE ALL SOURCES OF  
IGNITION. EVACUATE AREA. VENTILATE AREA. STOP RELEASE. DIKE TO CONTAIN  
SPILL. WEAR PROPER SAFETY EQUIPMENT. IF AMOUNT IS LARGE, REMOVE LIQUID BY  
VACUUM. IF SMALL, ABSORB ON INERT MATERIAL. DISPERSE RESIDUE.  
Neutralizing Agent: DILUTE WITH WATER  
Waste Disposal Method: UNUSED MATERIALS WILL BE A LAND-BANNED HAZARDOUS  
WASTE. TREAT/RECYCLE MATERIAL IN ACCORDANCE WITH ALL APPLICABLE  
REGULATIONS.  
Precautions-Handling/Storing: STORE IN TIGHTLY CLOSED CONTAINERS AWAY FROM  
HEAT, SPARKS, OPEN FLAME & STRONG OXIDIZING AGENTS. EMPTY CONTAINERS MAY  
CONTAIN FLAMMABLE VAPOR.  
Other Precautions: DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL,  
GRIND, OR EXPOSE CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR  
OTHER SOURCES OF IGNITION. MATERIAL MAY ATTACK SOME FORMS OF PLASTIC,  
ALUMINUM, RUBBER AND COATINGS.

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Control Measures

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Respiratory Protection: USE NIOSH/MSHA APPROVED AIR-PURIFYING OR SUPPLIED

**AIR RESPIRATOR AS APPROPRIATE.**

Ventilation: MECHANICAL(GENERAL) EXHAUST RECOMMENDED. LOCAL OR EXPLOSION PROOF VENTILATION MAY BE REQUIRED IN SOME CIRCUMSTANCES.

Protective Gloves: CHEMICAL RESISTANT GLOVES.

Eye Protection: CHEMICAL SPLASH GOGGLES &/OR FACESHIELD

Other Protective Equipment: EYE WASH STATION & SAFETY SHOWERS SHOULD BE AVAILABLE IN THE IMMEDIATE VICINITY OF ANY POTENTIAL EXPOSURE.

Work Hygienic Practices: WASH HANDS BEFORE EATING, DRINKING, SMOKING, OR USING TOILET FACILITIES. WASH CONTAMINATED CLOTHING BEFORE REUSE.

Suppl. Safety & Health Data: AVOID VOMITING IN CASES OF OVEREXPOSURE SINCE ASPIRATION INTO LUNGS IS A POSSIBLE HAZARD. PROPERLY GROUND LARGER DRUMS OF MATERIAL TO GUARD AGAINST STATIC ELECTRICITY. PRACTICE GOOD HOUSEKEEPING. POST NO-SMOKING SIGNS. NOTIFY THE NATIONAL RESPONSE CENTER IN CASE OF SPILLS.

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Transportation Data

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Trans Data Review Date: 91053

DOT PSN Code: HWY

DOT Proper Shipping Name: ISOPROPANOL OR ISOPROPYL ALCOHOL

DOT Class: 3

DOT ID Number: UN1219

DOT Pack Group: II

DOT Label: FLAMMABLE LIQUID

IMO PSN Code: ITA

IMO Proper Shipping Name: ISOPROPANOL

IMO Regulations Page Number: 3244

IMO UN Number: 1219

IMO UN Class: 3.2

IMO Subsidiary Risk Label: -

IATA PSN Code: ONH

IATA UN ID Number: 1219

IATA Proper Shipping Name: ISOPROPANOL

IATA UN Class: 3

IATA Label: FLAMMABLE LIQUID

AFI PSN Code: ONH

AFI Prop. Shipping Name: ISOPROPANOL

AFI Class: 3

AFI ID Number: UN1219

AFI Pack Group: II

AFI Label: FLAMMABLE LIQUID

AFI Basic Pac Ref: 7-7

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Disposal Data

---

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Label Data

---

Label Required: YES

Technical Review Date: 22FEB91

Label Status: F

Common Name: ISOPROPYL ALCOHOL

Chronic Hazard: YES

Signal Word: DANGER!

Acute Health Hazard-Moderate: X

Contact Hazard-Moderate: X

Fire Hazard-Severe: X

Reactivity Hazard-None: X

Special Hazard Precautions: ACUTE: OVEREXPOSURE MAY LEAD TO CNS

DEPRESSION, LEADING TO HEADACHES AND DIZZINESS. EYE: MAY LEAD TO IRRITATION

AND WILL INJURE EYE TISSUE IF NOT REMOVED PROMPTLY. SKIN: NO HEALTH HAZARD

ELIMINATE ALL SOURCES OF IGNITION. EVACUATE AREA. VENTILATE AREA. STOP

RELEASE. DIKE TO CONTAIN SPILL. WEAR PROPER SAFETY EQUIPMENT. IF AMOUNT IS

LARGE, REMOVE LIQUID BY VACUUM. IF SMALL, ABSORB ON INERT MATERIAL.

DISPERSE RESIDUE. STORE IN TIGHTLY CLOSED CONTAINERS AWAY FROM HEAT,

SPARKS, OPEN FLAME & STRONG OXIDIZERS.

Protect Eye: Y  
Protect Skin: Y  
Protect Respiratory: Y  
Label Name: FISHER SCIENTIFIC CO CHEMICAL DIV.  
Label Street: 1 REAGENT LANE  
Label City: FAIR LAWN  
Label State: NJ  
Label Zip Code: 07410  
Label Country: US  
Label Emergency Number: 201-796-7100 OR 201-796-7523

---

URL for this msds <http://siri.org>. If you wish to change, add to, or delete information in this archive please send updates to [dan@siri.org](mailto:dan@siri.org).

FISHER SCIENTIFIC -- METHANOL - METHANOL, TECHNICAL  
MATERIAL SAFETY DATA SHEET  
NSN: 6810002756010  
Manufacturer's CAGE: 1B464  
Part No. Indicator: A  
Part Number/Trade Name: METHANOL

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General Information

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Item Name: METHANOL, TECHNICAL  
Company's Name: FISHER SCIENTIFIC  
Company's Street: 1 REAGENT LANE  
Company's City: FAIR LAWN  
Company's State: NJ  
Company's Country: US  
Company's Zip Code: 07410  
Company's Emerg Ph #: 201-796-7100 OR 201-796-7523  
Company's Info Ph #: 201-796-7100  
Record No. For Safety Entry: 005  
Tot Safety Entries This Sk#: 027  
Status: SE  
Date MSDS Prepared: 14JAN91  
Safety Data Review Date: 14NOV92  
Supply Item Manager: CX  
MSDS Serial Number: BDSGR  
Specification Number: O-M-232  
Hazard Characteristic Code: F3  
Unit Of Issue: CN  
Unit Of Issue Container Qty: 5 GALLONS  
Type Of Container: CAN, METAL  
Net Unit Weight: 32.9 LBS

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Ingredients/Identity Information

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Proprietary: NO  
Ingredient: METHYL ALCOHOL (METHANOL) (SARA III)  
Ingredient Sequence Number: 01  
Percent: >99  
NIOSH (RTECS) Number: PC1400000  
CAS Number: 67-56-1  
OSHA PEL: S,200PPM/250STEL  
ACGIH TLV: S,200PPM/250STEL; 93

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Physical/Chemical Characteristics

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Appearance And Odor: CLEAR, COLORLESS LIQUID  
Boiling Point: 149F, 65C  
Vapor Pressure (MM Hg/70 F): 97MMHG@20C  
Vapor Density (Air=1): 1.11  
Specific Gravity: 0.792  
Decomposition Temperature: 725F, 385C  
Evaporation Rate And Ref: <1.0 (BUT ACETAT=1)  
Solubility In Water: COMPLETE  
Percent Volatiles By Volume: 100

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Fire and Explosion Hazard Data

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Flash Point: 52.0F, 11.1C  
Flash Point Method: TCC  
Lower Explosive Limit: 6.0  
Upper Explosive Limit: 36.5  
Extinguishing Media: DRY CHEMICAL, CARBON DIOXIDE, ALCOHOL-RESISTANT FOAM, WATER SPRAY  
Special Fire Fighting Proc: USE NIOSH APPROVED SCBA WITH FULL PROTECTION FOR FIREFIGHTING. DO NOT SCATTER THE FIRE. APPLY COOLING WATER TO COOL DOWN FIRE EXPOSED CONTAINERS.

Unusual Fire And Expl Hazrds: NONE SPECIFIED.MAY GIVE TOXIC VAPORS.

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Reactivity Data

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Stability: YES  
Cond To Avoid (Stability): HEAT,SPARKS,FLAME.  
Materials To Avoid: STRONG OXIDIZERS.  
Hazardous Decomp Products: CHLOROFORM,FORMALDEHYDE  
Hazardous Poly Occur: NO  
Conditions To Avoid (Poly): NONE SPECIFIED

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Health Hazard Data

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LD50-LC50 Mixture: 5628 MG/KG ORAL RAT.  
Route Of Entry - Inhalation: YES  
Route Of Entry - Skin: YES  
Route Of Entry - Ingestion: YES  
Health Haz Acute And Chronic: ACUTE-INGESTION:HARMFUL OR FATAL. ASPIRATION INTO LUNGS CAN CAUSE CHEMICAL PNEUMONIA AND CAN BE FATAL. INHALATION OF IRRITATION. CHRONIC-PROLONGED/REPEATED SKIN CONTACT MAY CAUSE IRRITATION, DERMATITIS.  
Carcinogenicity - NTP: NO  
Carcinogenicity - IARC: NO  
Carcinogenicity - OSHA: NO  
Explanation Carcinogenicity: NONE STATED.  
Signs/Symptoms Of Overexp: INHHALTION: EXCESSIVE BREATHING OF VAPORS MAY CAUSE NASAL AND RESPIRATORY IRRITATION. EYES: CAUSES SEVERE IRRITATION AND BLURRED VISION; SKIN: CAUSES IRRITATION. MAY BE HARMFUL IF ABSORBED THROUGH SKIN. MAY CAUSE AN ALLERGIC SKIN REACTION ON PROLONGED AND REPEATED CONTACT; INGESTION: MAY BE HARMFUL.CAUSES GI IRRITATION  
Med Cond Aggravated By Exp: INDIVIDUALS WITH KIDNEY, EYE, OR SKIN DISORDER MAY BE AT INCREASED RISK FROM EXPOSURE OF THIS MATERIAL.  
Emergency/First Aid Proc: EYE:FLUSH WITH WATER 15 MIN. SKIN:WASH WITH SOAP & WATER. INHALED:REMOVE TO FRESH AIR. GIVE ARTIFICIAL RESPIRATION OR OXYGEN AS NEEDED. INGESTED:DO NOT INDUCE VOMITING. GIVE LARGE QUANTITY OF MILK OR WATER.(NOTHING BY MOUTH IF UNCONSCIOUS.) GET IMMEDIATE MEDICAL ATTENTION. IF ANY IRRITATION PERSISTS OR IS SEVERE,GET PROMPT MEDICAL CARE.

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Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: REMOVE IGNITION SOURCES. CONTAIN LIQUID. USE PERSONAL PROTECTIVE EQUIPMENT. EVACUATE AREA IF POSSIBLE. ABSORB ON VERMICULITE. SCOOP UP AND PLACE IN A SUITABLE CONTAINER. KEEP PENDING DISPOSAL INSTRUCTIONS.  
Neutralizing Agent: NONE  
Waste Disposal Method: CONSULT LOCAL AUTHORITIES.DISPOSAL MUST BE IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS. SEE EPA DISPOSAL CODE FOR METHANOL FOR DISPOSAL PROCEDURES.  
Precautions-Handling/Storing: STORE IN COOL, DRY AND WELL-VENTILATED AREA. HANDLE AS CLASSIFIED FLAMMABLE LIQUIDS.  
Other Precautions: DO NOT SMOKE.AVOID CONTACT WITH EYES,SKIN & CLOTHINGS. DO NOT INHALE OR INGEST.

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Control Measures

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Respiratory Protection: USE NIOSH APPROVED ORGANIC VAPORS RESPIRATOR OR SCBA  
Ventilation: PROVIDE MECHAN(GEN/LOCAL EXHAUST)VENT TO MAINTN <TLV  
Protective Gloves: RUBBER  
Eye Protection: SAFETY/CHEM GOGGLES  
Other Protective Equipment: FULL PROTECTIVE CLOTHING,SAFETY SHOWER,EYE WASH STATION  
Work Hygienic Practices: USE GOOD CHEMICAL HYGIENE PRACTICE. AVOID UNNECESSARY CONTACT. WASH THOROUGHLY BEFORE EATING OR DRINKING.  
Suppl. Safety & Health Data: MSDS DATED APRIL 8,1980

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Transportation Data

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Trans Data Review Date: 96060  
DOT PSN Code: JEZ  
DOT Proper Shipping Name: METHANOL, OR METHYL ALCOHOL  
DOT Class: 3  
DOT ID Number: UN1230  
DOT Pack Group: II  
DOT Label: FLAMMABLE LIQUID, POISON  
IMO PSN Code: JPB  
IMO Proper Shipping Name: METHANOL  
IMO Regulations Page Number: 3251  
IMO UN Number: 1230  
IMO UN Class: 3.2  
IMO Subsidiary Risk Label: TOXIC  
IATA PSN Code: QHQ  
IATA UN ID Number: 1230  
IATA Proper Shipping Name: METHANOL  
IATA UN Class: 3  
IATA Subsidiary Risk Class: 6.1  
IATA Label: FLAMMABLE LIQUID & TOXIC  
AFI PSN Code: QHQ  
AFI Prop. Shipping Name: METHANOL OR METHYL ALCOHOL  
AFI Class: 3  
AFI ID Number: UN1230  
AFI Pack Group: II  
AFI Label: FLAMMABLE LIQUID, POISON  
AFI Basic Pac Ref: 7-7

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Disposal Data

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Disposal Data Review Date: 88231  
Rec # For This Disp Entry: 02  
Tot Disp Entries Per NSN: 012  
Landfill Ban Item: YES  
Disposal Supplemental Data: MSDS DATED APRIL 8, 1980 IN CASE OF ACCIDENTAL EXPOSURE OR DISCHARGE, CONSULT HEALTH AND SAFETY FILE FOR PRECAUTIONS.  
1st EPA Haz Wst Code New: U154  
1st EPA Haz Wst Name New: METHANOL; METHYL ALCOHOL  
1st EPA Haz Wst Char New: IGNITABLE (I)  
1st EPA Acute Hazard New: NO

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Label Data

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Label Required: YES  
Technical Review Date: 14NOV92  
Label Status: F  
Common Name: METHANOL  
Chronic Hazard: YES  
Signal Word: DANGER!  
Acute Health Hazard-Moderate: X  
Contact Hazard-Moderate: X  
Fire Hazard-Severe: X  
Reactivity Hazard-None: X  
Special Hazard Precautions: POISONOUS! CONTAIN METHYL ALCOHOL. MAY BE FATAL IF INHALED, SWALLOWED OR ABSORBED THROUGH SKIN. CONTACT MAY CAUSE BURNS TO SKIN AND EYES. RUNOFF FROM FIRE CONTROL OR DILUTION WATER MAY CAUSE POLLUTION. IN CASE OF CONTACT, WASH WITH SOAP AND WATER. FLUSH EYES WITH LARGE QUANTITY OF WATER. IF SWALLOWED, DRINK LARGE AMOUNT OF WATER. CONTACT POISON CONTROL CENTER.  
Protect Eye: Y  
Protect Skin: Y  
Protect Respiratory: Y  
Label Name: FISHER SCIENTIFIC, CHEMICAL DIV.  
Label Street: 1 REAGENT LANE  
Label City: FAIR LAWN

Label State: NJ  
Label Zip Code: 07410  
Label Country: US  
Label Emergency Number: 201-796-7100 OR 201-796-7523  
Year Procured: 1980

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CHEM SERVICE -- ZINC ACETATE, I-163  
MATERIAL SAFETY DATA SHEET  
NSN: 681000N067553  
Manufacturer's CAGE: 8Y898  
Part No. Indicator: A  
Part Number/Trade Name: ZINC ACETATE, I-163

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General Information

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Company's Name: CHEM SERVICE INC  
Company's P. O. Box: 3108  
Company's City: WEST CHESTER  
Company's State: PA  
Company's Country: US  
Company's Zip Code: 19381  
Company's Emerg Ph #: 215-692-3026  
Company's Info Ph #: 215-692-3026  
Safety Data Action Code: C  
Record No. For Safety Entry: 001  
Tot Safety Entries This Stk#: 001  
Status: SMJ  
Date MSDS Prepared: 01SEP88  
Safety Data Review Date: 19DEC95  
MSDS Serial Number: CBGCH

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Ingredients/Identity Information

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Proprietary: NO  
Ingredient: ZINC ACETATE, DIHYDRATE; (ZINC ACETATE)  
Ingredient Sequence Number: 01  
NIOSH (RTECS) Number: ZG8750000  
CAS Number: 5970-45-6  
OSHA PEL: N/K (FP N)  
ACGIH TLV: N/K (FP N)

Proprietary: NO  
Ingredient: SUPDAT:HAS ARRIVED. INGEST:DO NOT ADMIN LIQS/INDUCE VOMIT TO  
AN UNCON/CONVULSING PERSON. IF SWALLOWED DRINK 1-2 (ING 3)  
Ingredient Sequence Number: 02  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

Proprietary: NO  
Ingredient: ING 2:GLASSES OF WATER. CONT POIS CTL CTR IMMED IF NEC. GET  
MED ATTN IF NEC. IF PATIENT IS VOMIT-WATCH CLOSELY (ING 4)  
Ingredient Sequence Number: 03  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

Proprietary: NO  
Ingredient: ING 3:TO MAKE SURE AIRWAY DOES NOT BECOME OBSTRUCTED BY VOMIT.  
Ingredient Sequence Number: 04  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

Proprietary: NO  
Ingredient: EYE PROT:AND FULL LENGTH FACE SHIELD (FP N).  
Ingredient Sequence Number: 05  
NIOSH (RTECS) Number: 9999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

Proprietary: NO



Ingredient: HAZ DECOMP PRODS:FLAMMABLE. EFFLORESCENT.  
Ingredient Sequence Number: 06  
NIOSH (RTECS) Number: 999999ZZ  
OSHA PEL: NOT APPLICABLE  
ACGIH TLV: NOT APPLICABLE

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Physical/Chemical Characteristics

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Appearance And Odor: PUNGENT, ACRID ODOR. COLORLESS CRYSTALLINE SOLID.  
Melting Point: 212F,100C  
Specific Gravity: 1.735  
Solubility In Water: SOLUBLE

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Fire and Explosion Hazard Data

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Extinguishing Media: CARBON DIOXIDE OR DRY CHEMICAL POWDER. DO NOT USE WATER  
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).  
Unusual Fire And Expl Hazrds: NONE SPECIFIED BY MANUFACTURER.

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Reactivity Data

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Stability: YES  
Cond To Avoid (Stability): DO NOT USE MAGNESIUM/ALUMINUM OR THEIR ALLOYS AS CONTAINERS.  
Materials To Avoid: REACTS WITH ACID HALIDES, ANHYDRIDES, PHOSPHORUS HALIDES, THIONYL CHLORIDE & CARBONATES. INCOMPAT W/STRONG BASES.  
Hazardous Decomp Products: DECOMP LIBERATES TOX FUMES. CORRODES STEEL, COPPER & ITS ALLOYS. DECOMP UNDER ALKALINE CNDTNS. DECOMP PRODS ARE (TNG 6)  
Hazardous Poly Occur: NO \*  
Conditions To Avoid (Poly): NOT RELEVANT \*

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Health Hazard Data

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LD50-LC50 Mixture: LD50(RAT):2460 MG/KG \*  
Route Of Entry - Inhalation: YES \*  
Route Of Entry - Skin: YES \*  
Route Of Entry - Ingestion: YES \*  
Health Haz Acute And Chronic: CONT LENSES SHOULD NOT BE WORN IN LAB. ALL CHEMS SHOULD BE CONSIDERED HAZ-AVOID DIRECT PHYSICAL CONT! CAN CAUSE EYE AND SKIN IRRITATION. REPEATED EXPOSURE TO VAPORS AND/OR DUST CAN CAUSE EYE INJURY. CAN BE HARMFUL IF INHALED. DUST AND/OR VAPORS CAN CAUSE IRRITATION TO RESPIRATORY TRACT. CAN BE HARMFUL (EFTS OF OVEREXP) \*  
Carcinogenicity - NTP: NO \*  
Carcinogenicity - IARC: NO \*  
Carcinogenicity - OSHA: NO \*  
Explanation Carcinogenicity: NOT RELEVANT \*  
Signs/Symptoms Of Overexp: HLTH HAZS:SWALLOWED. CAN CAUSE GASTRO-INTESTINAL DISTURBANCES. POSSIBLE CHOLINESTERASE INHIBITOR-MAY CAUSE SEIZURES; NAUSEA; VOMITING; AIRWAY OBSTRUCTION AND/OR INCREASED MUCOUS SECRETIONS IN THE LUNGS. INGESTION MAY CAUSE DIARRHEA. \*  
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER. \*  
Emergency/First Aid Proc: AN ANTIDOTE IS SUBSTANCE INTENDED TO COUNTERACT EFT OF POIS. IT SHOULD BE ADMIN ONLY BY MD/TRAINED EMER PERS. MED ADVICE CAN BE OBTAINED FROM POIS CTL CTR. EYES:FLUSH CONTINUOUSLY W/ WATER FOR @ LST 15 MIN. SKIN:FLUSH W/WATER FOR 15-20 MIN. IF NO BURNS HAVE OCCURRED-USE SOAP & WATER TO CLEANSE. REMOVE & WASH CONTAM CLTHG. DO NOT WEAR SHOES/CLTHG UNTIL ABSOLUTELY FREE OF ALL CHEM ODORS. (SUPDAT) \*

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Precautions for Safe Handling and Use

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Steps If Mail Released/Spill: EVACUATE AREA. WEAR APPROPRIATE OSHA-REGULATED EQUIPMENT. VENTILATE AREA. SWEEP UP AND PLACE IN AN APPROPRIATE CONTAINER. HOLD FOR DISPOSAL. WASH CONTAMINATED SURFACES TO REMOVE ANY RESIDUES \*

Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER. \*

Waste Disposal Method: DISPOSAL MUST BE I/A/W FEDERAL, STATE & LOCAL REGULATIONS (FP N). DISPOSE OF IN AN APPROVED CHEMICAL LANDFILL. \*

Precautions-Handling/Storing: USE APPROP OSHA/MSMA APPRVD SFTY BQUTP. AVOID CONT W/SKIN, EYES & CLTHG. KEEP TIGHTLY CLSD & STORE IN COOL, DRY PLACE. STORE ONLY W/COMPATIBLE CHEMS. \*

Other Precautions: PERSONS NOT SPECIFICALLY & PROPERLY TRAINED SHOULD NOT HNDL CHEM/ITS CNTNR. FURNISHED FOR LAB USE ONLY! MAY NOT BE USED AS DRUGS, COSMETICS, AGRICULTURAL/PESTICIDAL PRODS, FOOD ADDITIVES/AS HOUSEHOLD CHEMS. \*

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#### Control Measures

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Respiratory Protection: USE NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N). \*

Ventilation: THIS CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD. \*

Protective Gloves: IMPERVIOUS GLOVES (FP N). \*

Eye Protection: ANSI APPRVD CHEM WORKERS GOGGS (ING 5) \*

Other Protective Equipment: ANSI APPROVED EMERGENCY EYE WASH AND DELUGE SHOWER (FP N). \*

Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER. \*

Suppl. Safety & Health Data: FIRST AID PROC:INHAL:REMOVE TO FRESH AIR. ADMIN OXYG IF PATIENT IS HAVING DFCLTY BRTHG. IF PATIENT HAS STOPPED BRTHG ADMIN ARTF RESP. IF PATIENT IS EXHIBITING SIGNS OF SHOCK-KEEP WARM & QUIET. GET MED ATTN IF NEC. IF PATIENT IS IN CARDIAC ARREST ADMIN CPR. CONTINUE LIFE SUPPORTING MEASURES UNTIL MED ASSISTANCE (ING 2) \*

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#### Transportation Data

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#### Disposal Data

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#### Label Data

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Label Required: YES

Technical Review Date: 19DEC95

Label Status: B

Common Name: ZINC ACETATE, I-163

Chronic Hazard: NO

Signal Word: WARNING!

Acute Health Hazard-Moderate: X

Contact Hazard-Moderate: X

Fire Hazard-None: X

Reactivity Hazard-Slight: X

Special Hazard Precautions: DECOMPOSITION LIBERATES TOXIC FUMES. ACUTE:CAN CAUSE EYE AND SKIN IRRITATION. REPEATED EXPOSURE TO VAPORS AND/OR DUST CAN CAUSE EYE INJURY. CAN BE HARMFUL IF INHALED. DUST AND/OR VAPORS CAN CAUSE IRRITATION TO RESPIRATORY TRACT. CAN BE HARMFUL IF SWALLOWED. CAN CAUSE GASTRO-INTESTINAL DISTURBANCES. POSSIBLE CHOLINESTERASE INHIBITOR-MAY CAUSE SEIZURES; NAUSEA; VOMITING; AIRWAY OBSTRUCTION AND/OR INCREASED MUCOUS SECRETIONS IN THE LUNGS. INGESTION MAY CAUSE DIARRHEA. CHRONIC:NONE SPECIFIED BY MANUFACTURER.

Protect Eye: X

Protect Skin: X

Protect Respiratory: X

Label Name: CHEM SERVICE INC

Label P O Box: 3108

Label City: WEST CHESTER

Label State: PA

Label Zip Code: 19381

Label Country: US




Label Emergency Number: 215-692-3026

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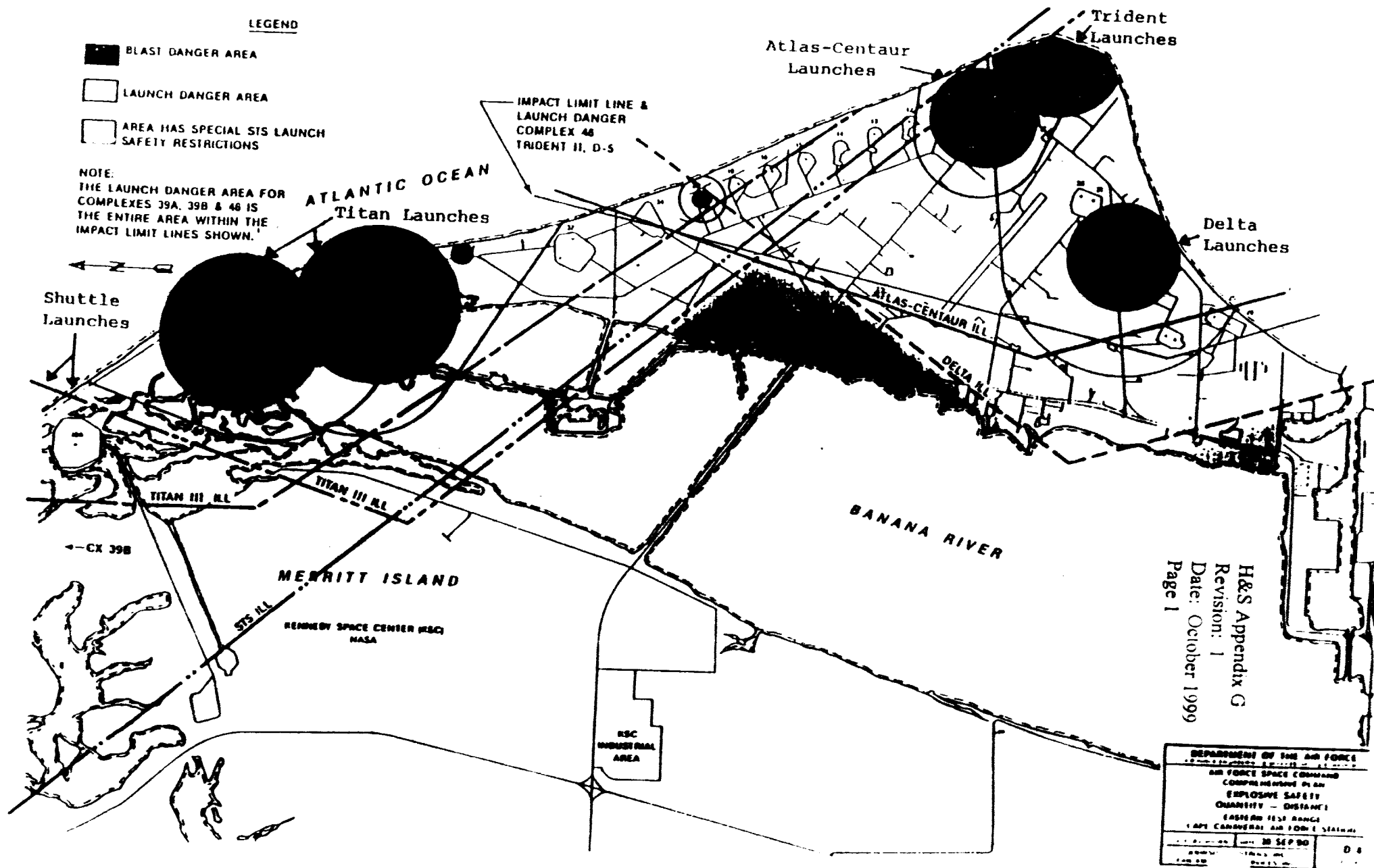
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**APPENDIX G**  
**LAUNCH BLAST ZONES**

# LEGEND

-  BLAST DANGER AREA
-  LAUNCH DANGER AREA
-  AREA HAS SPECIAL STS LAUNCH SAFETY RESTRICTIONS

NOTE:  
THE LAUNCH DANGER AREA FOR  
COMPLEXES 39A, 39B & 48 IS  
THE ENTIRE AREA WITHIN THE  
IMPACT LIMIT LINES SHOWN.



H&S Appendix G  
Revision: 1  
Date: October 1999  
Page 1

DEPARTMENT OF THE AIR FORCE			
AIR FORCE SPACE COMMAND			
COMPROSECURITY OF AIR			
EXPLOSIVE SAFETY			
QUANTITY - DISTANCE			
EARTH AND TEST RANGE			
CAPT. CANNONBALL AIR FORCE STATION			
DATE	TIME	BY	NO. OF
20 SEP 90			
FOR	TO	BY	NO. OF